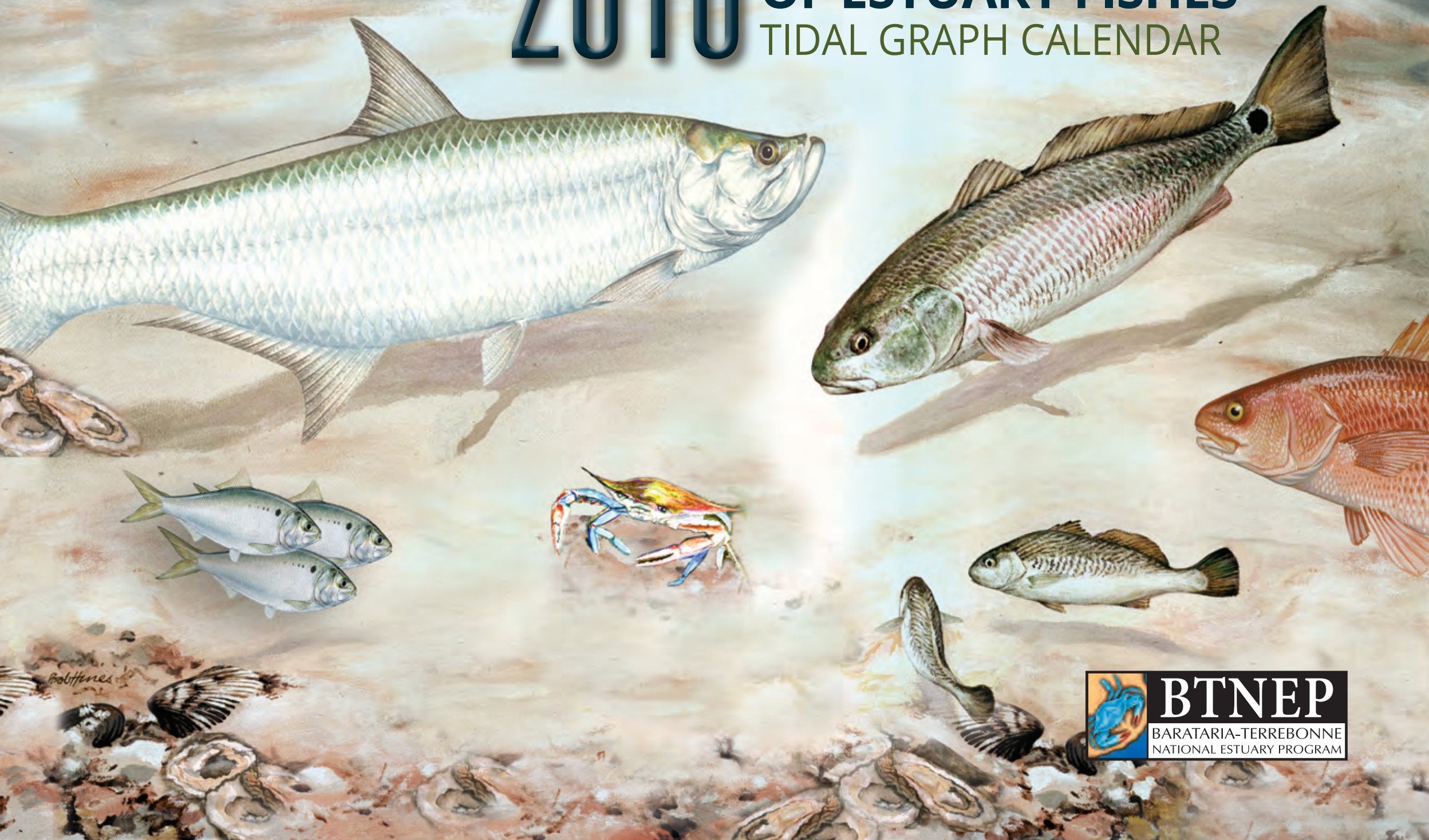


BARATARIA-TERREBONNE NATIONAL ESTUARY PROGRAM

2016 THE SECRET LIVES OF ESTUARY FISHES

TIDAL GRAPH CALENDAR





BARATARIA-TERREBONNE NATIONAL ESTUARY PROGRAM

Established in 1991, the mission of the Barataria-Terrebonne National Estuary Program (BTNEP) is the preservation and restoration of the Barataria-Terrebonne estuarine system, the 4.2 million-acre region between the Atchafalaya and Mississippi River basins. BTNEP strives to rebuild and protect the estuary for future generations through the implementation of a science-based, consensus-driven plan that utilizes partnerships focused on the estuary's rich cultural, economic and natural resources.



Illustration by Diane Baker

Can Fish Tell Time?

The idea of fish, other animals, plants, fungi and bacteria telling time seems like a funny idea when you first think about it. However, fishes, similar to other organisms, experience time changes related to the cycles of day and night, referred to as circadian rhythms. These rhythms have been observed in plants, animals, fungi and cyanobacteria. Scientists believe these cycles are controlled by coding in the organism's DNA, referred to as clock genes, which control the organism's response to day and night as well as sleep patterns in some vertebrates. Each organism has a built-in ability to tell time, which is inherited as an evolved trait but patterns are adjusted by local environmental factors, called "time givers," such as light, temperature and chemical processes. There are three "time behaviors" exhibited by various organisms throughout a 24 hour cycle: 1) Diurnal – active during the daytime and inactive at night, 2) Nocturnal – active during the nighttime and inactive during daytime, and 3) Crepuscular – active during twilight or dawn and dusk hours. Fish in the oceans or coastal areas experience tides twice per day. Tides, caused by the alignment of the sun, moon and earth are the major "time givers," along with the rising and setting of the sun that signal fish to reset their internal clocks. As most fishermen know, the coincidence of a moving tide at dawn or dusk is usually a great time for fishing. So, can fish tell time? Yes, and they do it without the assistance of mechanical clocks or cell phones..

Ancient Egyptian sun dial, Wikimedia Commons



Cracow sun dial, Wikimedia Commons



Sun dial, MN, Wikimedia Commons

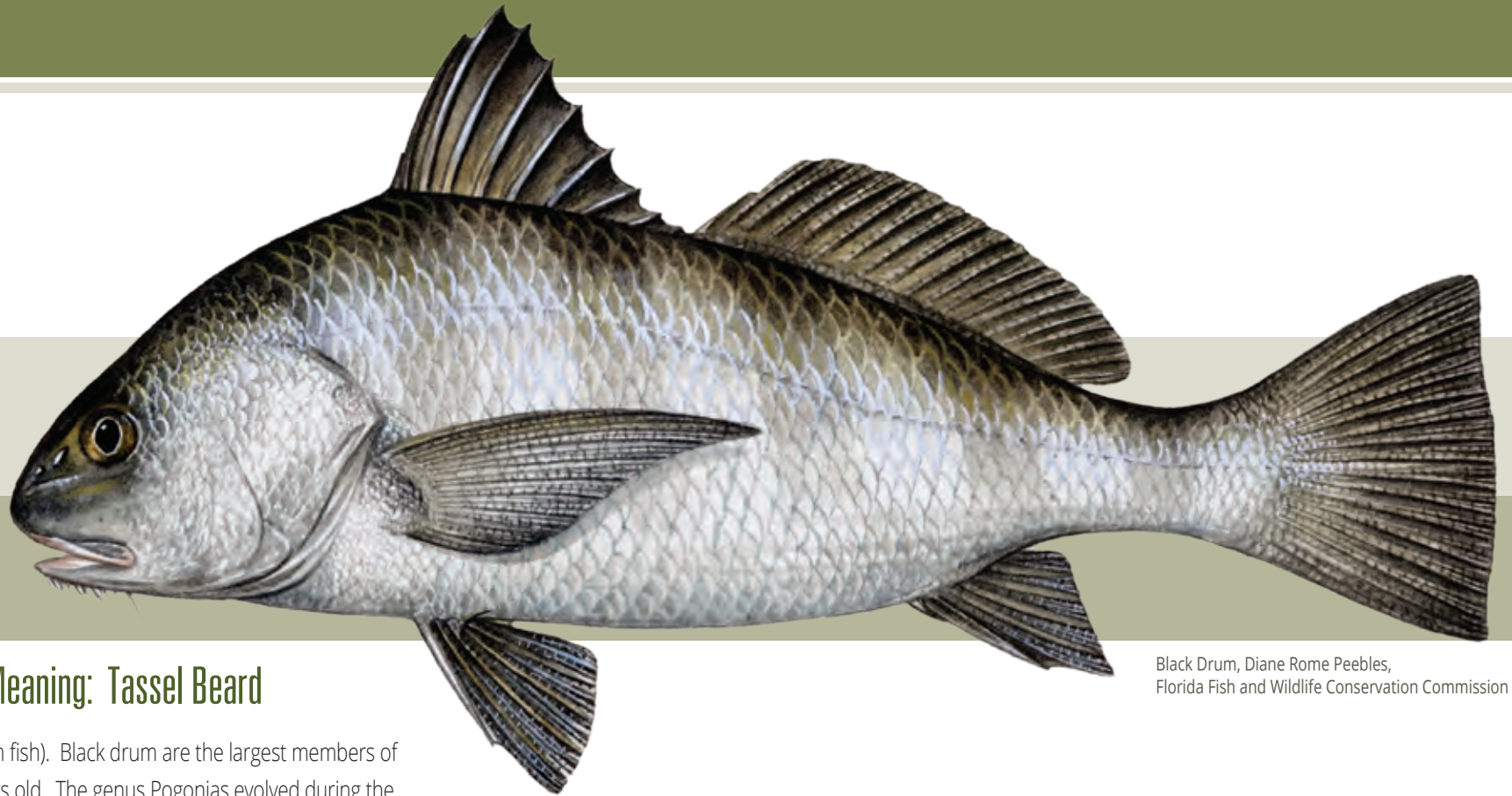
Meanings of Scientific Names

For each article in the calendar, the meanings of the scientific names of each fish species were given to provide another view into their secret lives. Scientific names are constructed from either Greek or Latin roots, or a notable name are combined into a first (Genus) and second (species) name. This system of naming was invented by the botanist, Carolus Linnaeus. So, for the title of each article we provide the common and scientific names of the fish and our best interpretation of their scientific name.



Archosargus probatocephalus
Diane Rome Peebles, Florida Fish and Wildlife Conservation Commission

Black DRUM



Black Drum, Diane Rome Peebles,
Florida Fish and Wildlife Conservation Commission

Scientific Name: Pogonias cromis, Meaning: Tassel Beard

Black drum are fish in the Sciaenidae family (drum fish). Black drum are the largest members of the drum family, able to reach 90 lbs. and 44 years old. The genus Pogonias evolved during the Miocene epoch, around 23 million years ago. Geographically, they range from Nova Scotia to Argentina in coastal waters. Similar to sheepshead, they are silver in color with 4 to 6 bold, black, vertical stripes, which fade in older fish. Dissimilar to sheepshead, they have an elongated body and sensitive barbells on their chin, which they use to find food. As larvae (less than 0.1 inch), they mainly eat zooplankton, but switch to worms and small fish at about 8 inches in length. They achieve their adult form around 0.5 inch. Juvenile drum prefer shallow, muddy, low salinity areas within an estuary; whereas adults prefer saltier bays and passes. Similar to other fish in the drum family, they make drumming sounds by beating special abdominal muscles against their swim bladder. With a downward-placed mouth, they hunt for food along water bottoms and oyster beds, waiting near structures to ambush prey washed in by currents. With strong jaws and pharyngeal teeth, they easily crush mollusks, crabs and oysters. Occasionally, parasitic worms can be found in the tail of large drum. "Spaghetti worms" are part of a complex lifecycle between sharks, copepods, small fish and the drum that is completed when the drum is eaten by a shark. Black drum spawn in open bays and passes leading to the Gulf of Mexico between November and July, when they reach 17 to 21 inches in length. Recreationally, they account for a large number of fish taken through angling in saline waters along the Gulf Coast. Commercially, they can negatively affect oyster harvests from leases and are able to eat 1-2 commercial-sized oysters per pound of body weight each day.



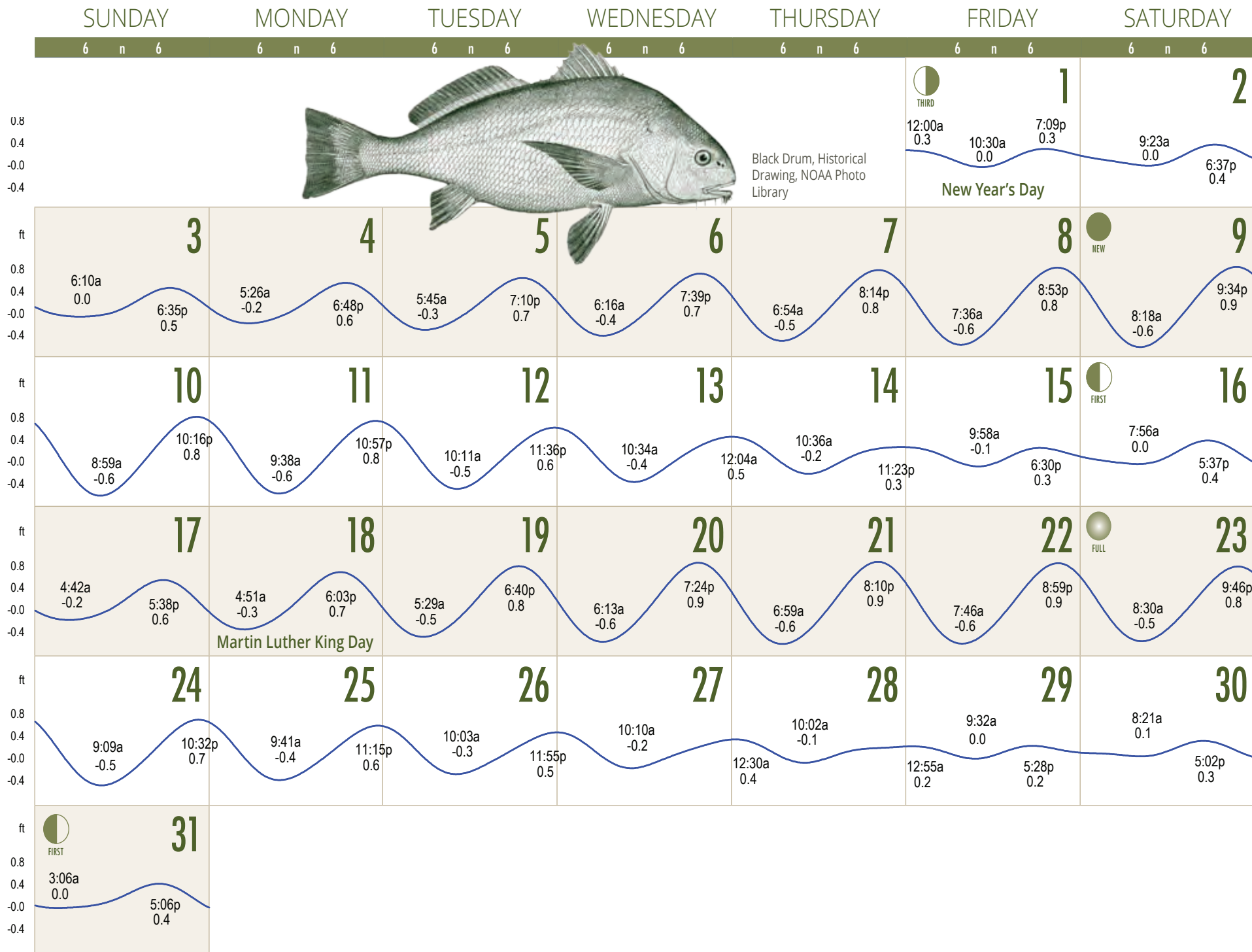
Top Left: Black drum, Dean Blanchard



Top Right: Black Drum,
Wikimedia Commons

Bottom Right: Pharyngeal Teeth,
Freshwater Drum

January 2016



DECEMBER 2015

S	M	T	W	T	F	S
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6	7	8	9	10	11	12
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27	28	29	30	31		

FEBRUARY 2016

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7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29					

High Tide:
January 21
8:10 p.m. • 0.9 ft.

Low Tide:
January 10
8:59 a.m. • -0.6 ft.



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Tides from Barataria Bay, Grand Isle, East Point,
29d 15'48" N 89d 57' 24" W
Tides & Currents by Jeppesen Marine
www.nobeltec.com

Tide adjustment table can be found on the inside back cover

Sheepshead

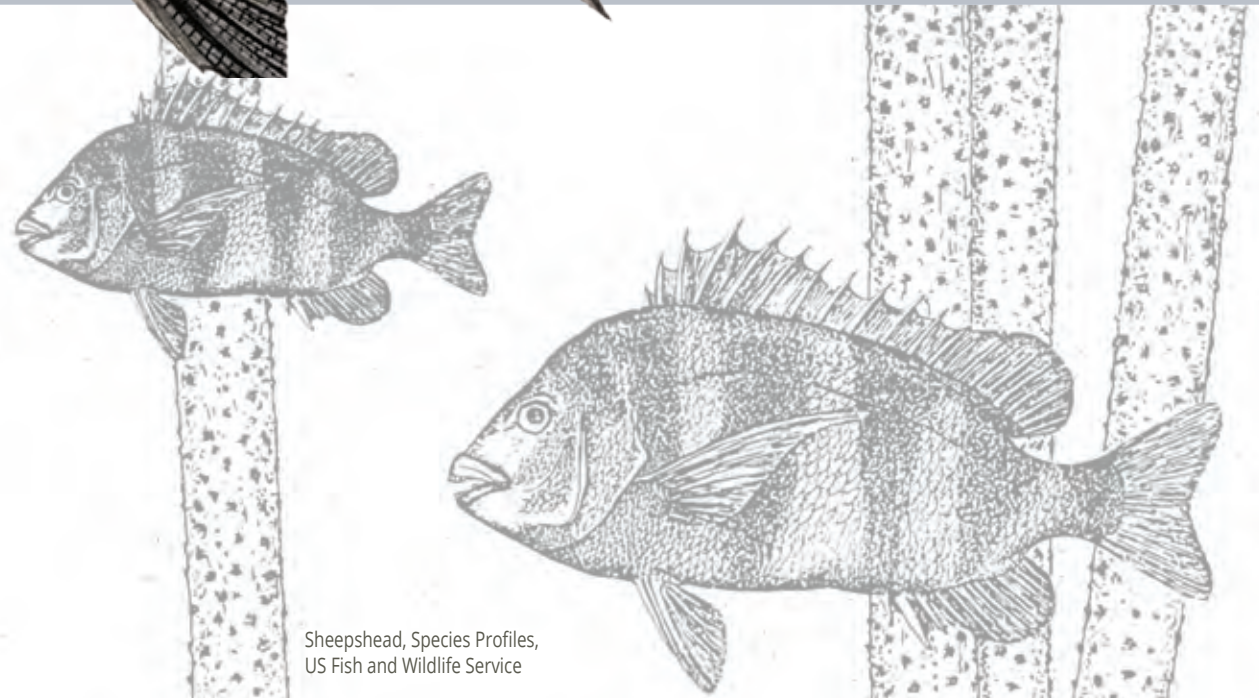
Scientific Name: Archosargus probatocephalus,

Meaning: Worthy Head and Sea Bream Ruler

Sheepshead are fish in the Sparidae family (sea bream). The genus Archosargus evolved at the beginning of the Eocene epoch around 56 million years ago. Similar to black drum, sheepshead are silver in color with 4 to 6 bold, black, vertical stripes. Dissimilar to black drum, they have a shorter, oval, flattened body. They have sharp gill covers and large, sharp dorsal spines. Human-like teeth in the front of their mouths combined with several rows of molars give sheepshead the versatility to eat a variety of foods including plants, algae, barnacles, shrimp, fish, blue crabs, oysters, and other marine invertebrates. The sheepshead's versatile teeth is why they have a reputation for being bait thieves and difficult to hook. Although found offshore in full strength Gulf sea water of 35 ppt salinity, they are most abundant within shallow estuary depths and between 5 and 10 ppt salinities. Larval fish are between 0.2 and 1 inch and achieve adult characteristics while still in this stage much earlier than other fish in the Sparidae family. Juvenile sheepshead are between 1 and 1.2 inches. When they reach about 1.6 inches, they leave the grassbeds and begin to congregate with adults near hard, open structures like oyster reefs, where they switch from eating filamentous algae and copepods to mollusks and crustaceans. Adult fish commonly reach 10 to 20 inches, but can reach 36 inches long and 21 lbs. in weight, with the record in Louisiana of 21.25 lbs. Sheepshead overwinter in offshore waters in the Gulf of Mexico and spawn in March, April and May and then return to inshore estuaries where they remain the rest of the year.



Sheepshead, Diane Rome Peebles,
Florida Fish and Wildlife Conservation Commission



Sheepshead, Species Profiles,
US Fish and Wildlife Service



Courtesy of Sonny Schindler, Shore Thing
Charters, Gulf Coast Research Laboratory

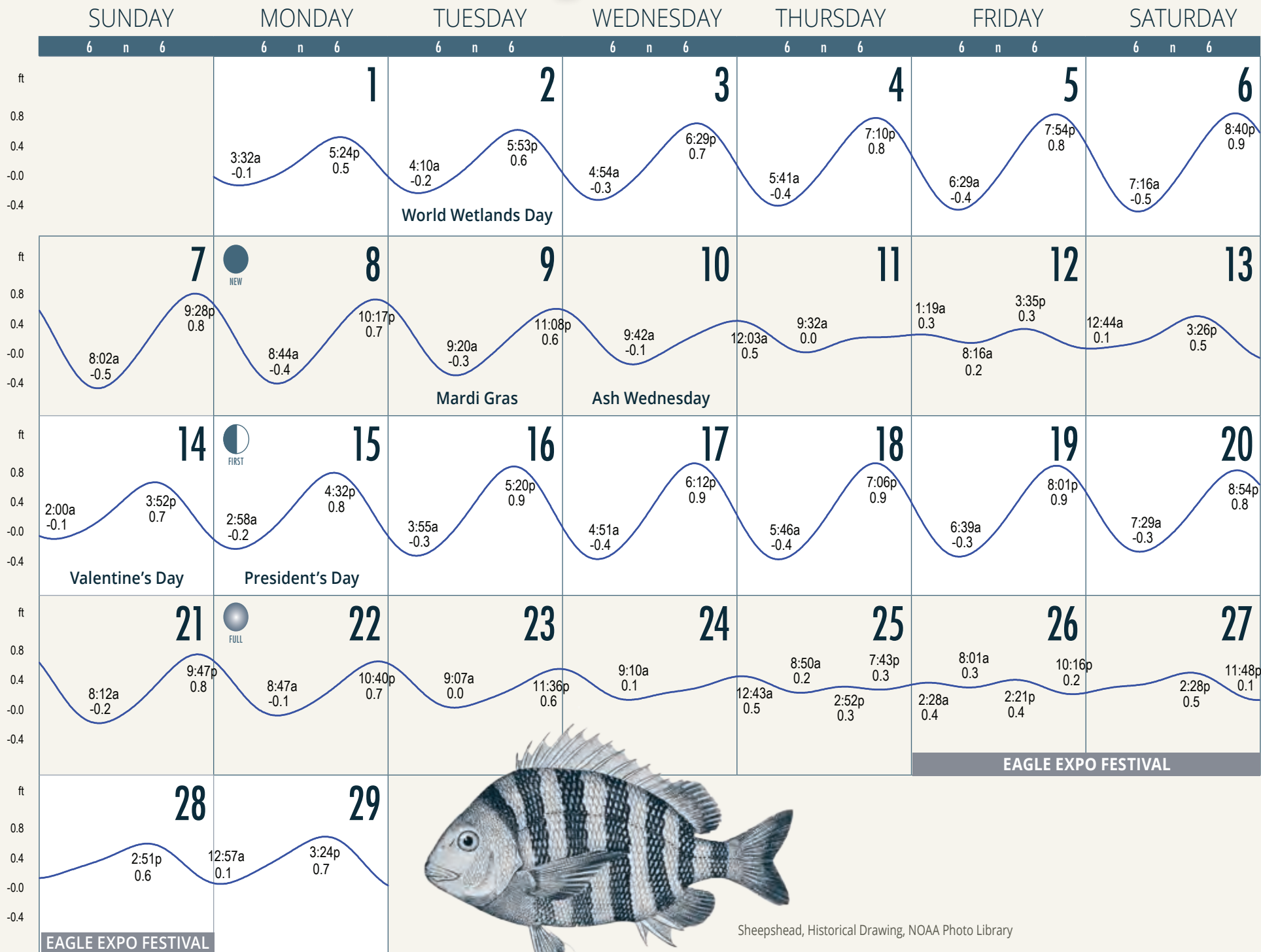


Sheepshead mouth,
Virginia Institute of Marine Science



Speared Sheepshead, Dave Curtiss

February 2016



Sheepshead, Historical Drawing, NOAA Photo Library

JANUARY

S	M	T	W	T	F	S
				1	2	3
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MARCH

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15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

High Tide:

February 18
7:06 p.m. • 0.9 ft.

Low Tide:

February 6
6:21 a.m. • -0.5 ft.



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29d 15'48" N 89d 57' 24" W
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Spotted Seatrout, Speckled Trout

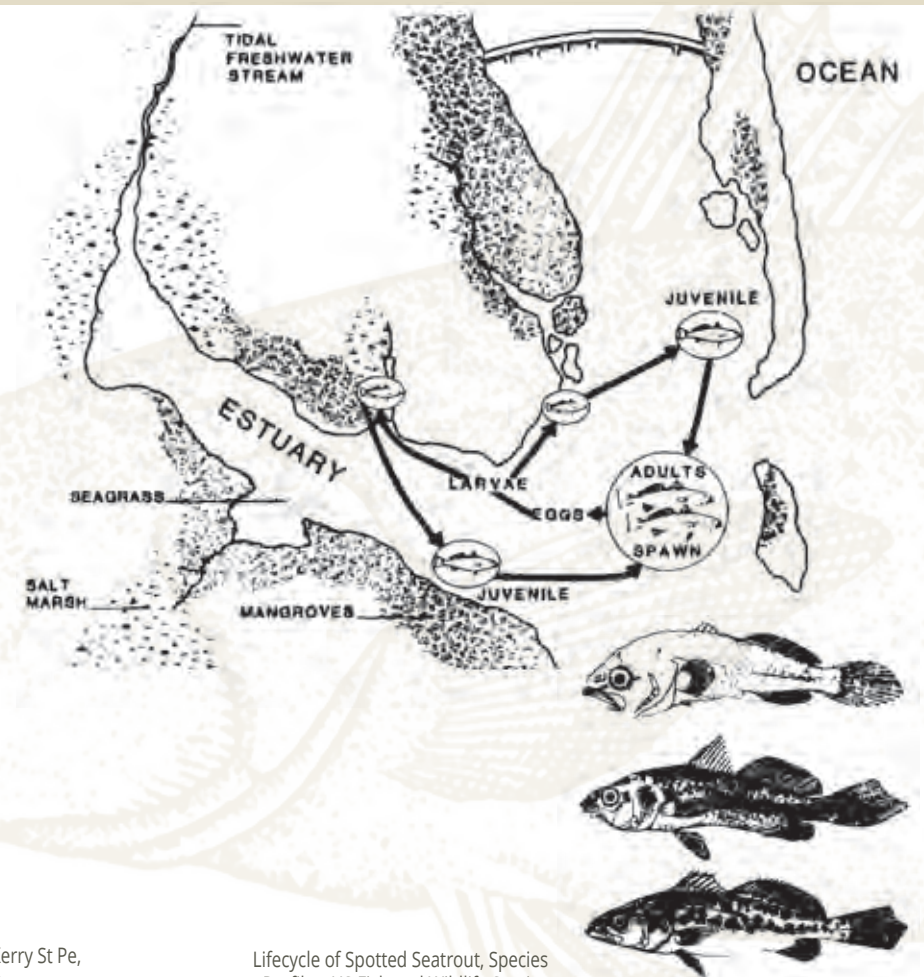


Spotted Seatrout, Diane Rome Peebles, Florida Fish and Wildlife Conservation Commission

Scientific Name: Cynoscion nebulosus, **Meaning:** Spotted Dog-Toothed Fish

Spotted seatrout are not trout nor are they related to trout. They are fish in the Sciaenidae family (drum fish). The genus Cynoscion evolved during the Miocene epoch about 11.5 million years ago. They range from Cape Cod to the Gulf of Mexico, spending winters in low salinity waters and summers in high salinity waters. Seatrout are torpedo-shaped, dark silvery-grey on top and pale underneath with dark spots on the upper sides, dorsal fin and tail. A yellow mouth sports one to two "canine" teeth on the upper lip. Occasionally, spaghetti worm parasites infest seatrout, which complete their lifecycle in sharks. Larvae congregate in marsh vegetation and double in length every 2 weeks, reaching 8 inches in their first year. Fish less than 6 inches feed on zooplankton and shrimp-like crustaceans. Fish longer than 6 inches feed on shrimp in summer and bait fish in winter and are usually active at night and early morning hours. All males and 75% of females are sexually-mature at 12 inches long. Seatrout between 5 to

12 years old or weighing more than 5 pounds are females. Spawning begins when water temperatures reach 68 degrees (F) with a peak around 80 degrees (F). During spawning, male trout form drumming aggregations with thousands of fish at night near passes and channels with good tidal flow where the salinity is between 17 to 35 ppt. Together they vibrate their air bladders, producing a roaring sound, which attracts females. Fertilized eggs are swept into the estuaries with the tide. Seatrout eggs are buoyant in high salinities and sink in low salinities, a mechanism that limits egg movement into fresher areas of the estuary, since eggs and larval fish require higher salinities.



(1)



(2)

(1) Spotted Sea Trout and Dean Blanchard by Kerry St Pe,
(2) Spotted Sea Trout on Stringer by Kerry St Pe

Lifecycle of Spotted Seatrout, Species Profiles, US Fish and Wildlife Service

March 2016



FEBRUARY

S	M	T	W	T	F	S
	1	2	3	4	5	6
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28	29					

APRIL

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10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

High Tide:
March 5
5:49 p.m. • -0.2 ft

Low Tide:
March 4
5:49 a.m. • -0.2 ft



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29d 15'48" N 89d 57' 24" W
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Tide adjustment table can be found on the inside back cover

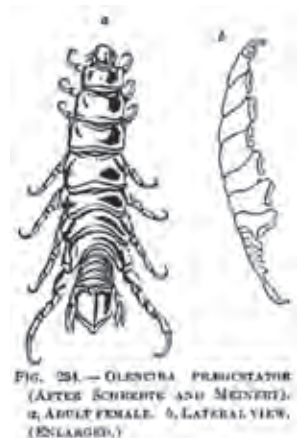
GULF Menhaden, Pogy



Gulf Menhaden Illustration by Diane Rome Peebles, Florida Fish and Wildlife Conservation Commission

Scientific Name: Brevoortia patronus, **Meaning:** Brevoort's donor (refers to tongue parasite)

Gulf menhaden are ecologically important, small, marine, filter-feeding fish in the Clupeidae family (sardines). The Clupeidae family evolved about 55 million years ago during the Eocene Epoch. They range throughout the Gulf of Mexico. By weight they are the second largest commercial fishery in the U.S., used as feed for livestock and fish. The body is silvery-green on the back with a dark spot behind the gill plates, followed by a line of smaller, lighter spots leading to a forked tail fin with a dark margin. Menhaden live 3 to 4 years. Both immature and adult fish use basket-like gill rakers to filter feed. Gill rakers are evolutionary modifications of gill arches into a sieve structures that the fish uses to capture tiny plankton for food. Plankton comes from the same root word as planets, meaning wanderer, because plankton cannot swim. Immature menhaden feed on phytoplankton, while adults feed on larger zooplankton. Adults feed with their mouths open and their lower jaw thrust forward as they swing their bodies side to side. Menhaden are parasitized by the organism, Olencira praegustator, a type of isopod that attaches itself to the fish's tongue, causing the tongue to fall off. The parasite then functions as the tongue of the fish. Menhaden reach maturity at about 4 inches in length. Spawning migrations occur from mid-June through winter as they travel from estuaries to the open Gulf of Mexico, where they spawn from October through March. The floating fertilized eggs hatch and the larvae are carried into the estuaries on the incoming tides. Once in the estuaries, they collect near shore in marsh grasses for protection. Becoming juveniles near 1 inch in length, they begin to travel in dense schools near the surface to filter feed on phytoplankton and the cycle begins again.



left: Olencira Praegustator, Parasite of fish tongue, A Monograph on the Isopods of North America Issue 54, Harriet Richardson



(1)



(4)



(2)



(5)



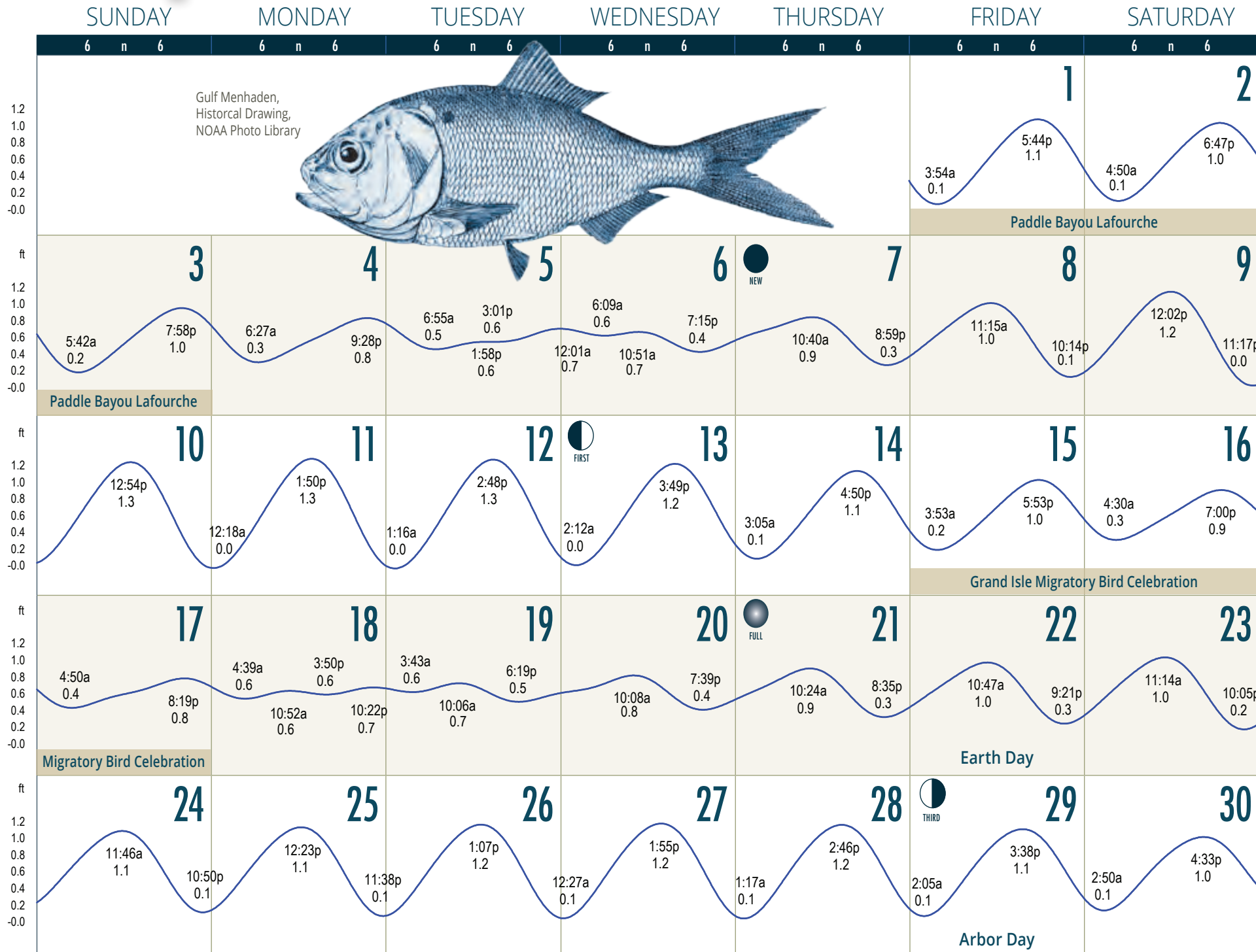
(3)



(6)

- (1) Gulf Menhaden, B patronus, Wikimedia Commons, (2) Menhaden Fishing, NOAA NMFS Department of Commerce, (3) Menhaden fishing - beginning to set out the nets in purse seining operation, NOAA NMFS, Robert K Brigham, (4) Menhaden fishing - closing the net and trapping the fish, NOAA NMFS Department of Commerce, Bob Williams, (5) Menhaden Fishing Boat, NOAA Department of Commerce, Bob Williams, and (6) Portugese catching Menhaden, NOAA Photo Library, photograph by T. W. Smillie

April 2016



MARCH

S	M	T	W	T	F	S
		1	2	3	4	5
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MAY

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1	2	3	4	5	6	7
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15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

High Tide:
April 11
1:50 p.m. • 1.3 ft.

Low Tide:
April 12
1:16 a.m. • -0.2 ft.



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29d 15'48" N 89d 57' 24" W
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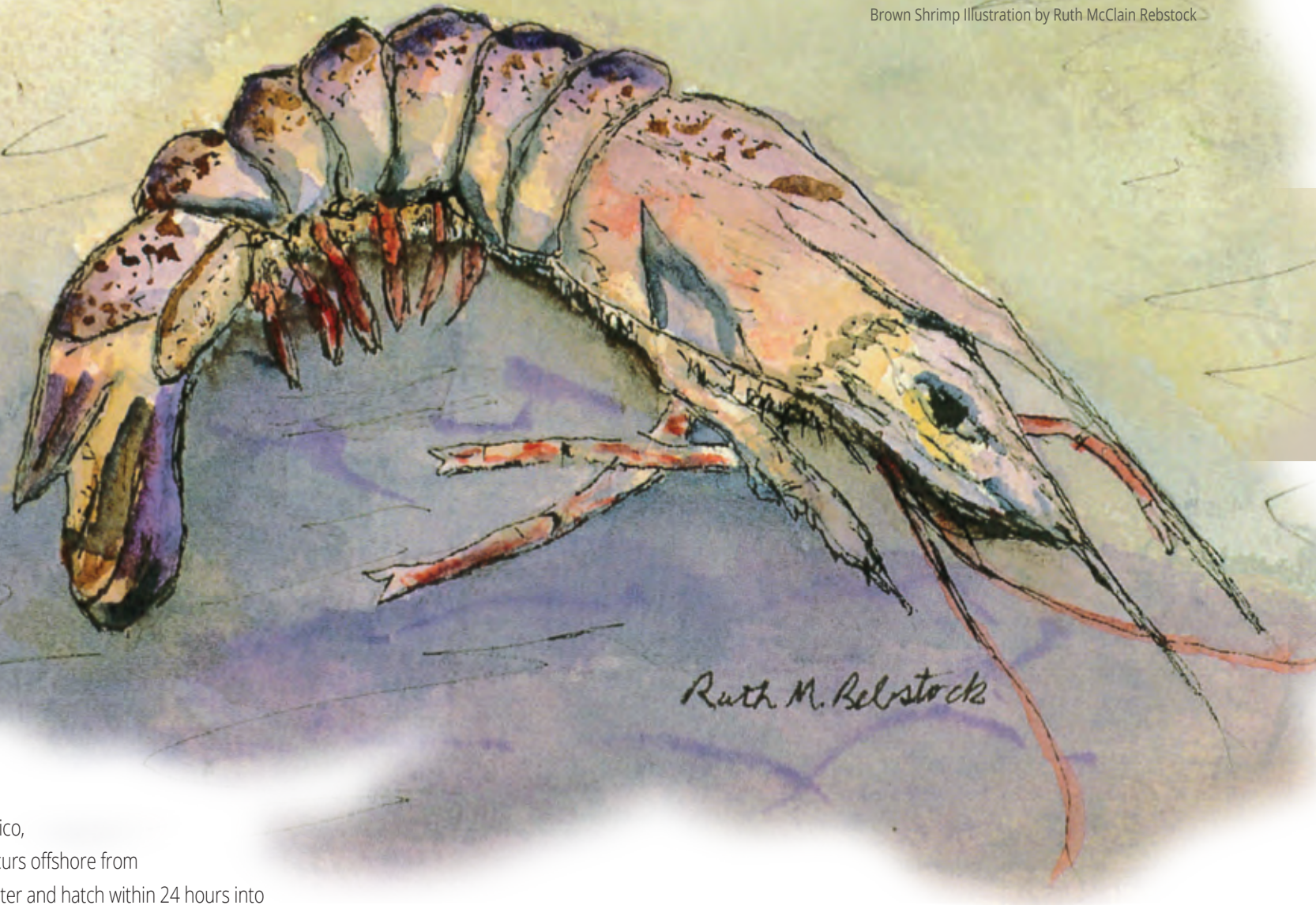
Brown SHRIMP

Scientific Name: Farfantepenaeus aztecus,

Meaning: Farfante — a shrimp scientist; penaeus — a river in northern Greece; aztecus — Northern Mexico

Brown shrimp are crustaceans in the Penaeidae family (shrimp having rostrums) that evolved during the Triassic Period around 250 million years ago. They range from Massachusetts to Texas and are distinguished from other shrimp species by relatively long grooves on either side of the horn on their head. Brown and white shrimp make up 99% of the shrimp fishery in the Gulf of Mexico, constituting one of the most valuable fisheries in the U.S. Spawning occurs offshore from September through May. After spawning, eggs are released into the water and hatch within 24 hours into the first larval stage. As larvae, they feed on plankton. Over the next month, they go through three major larval stages before transforming into the postlarval stage and moving into estuaries during the late winter and early springtime. Once in estuaries, they transform into juveniles, living near marsh edges for protection and food. Salt marshes, predominantly comprised of Spartina alterniflora, are some of the most productive ecosystems on the planet. Similar to Iowa cornfields, they are monocultures, but produce more organic matter per acre. As the Spartina grows, the plant produces organic matter, which feeds shrimp and significantly contributes to the food web of the Gulf of Mexico. As detritivores, shrimp play an ecologically important role in food webs, because they convert organic matter into biomass at a growth rate of about 1 mm per day, during warm spring seasons. In turn, brown shrimp become food for various predatory species, like red drum and spotted sea trout. By the middle of summer, the warm estuary waters have produced shrimp that have reached a size large enough to migrate back out into the Gulf where they become sexually-mature. High tidal ranges associated with new and full moons during the months of May, June, and July signal to the shrimp to migrate to the Gulf and begin the cycle over again.

Brown Shrimp Illustration by Ruth McClain Rebstock

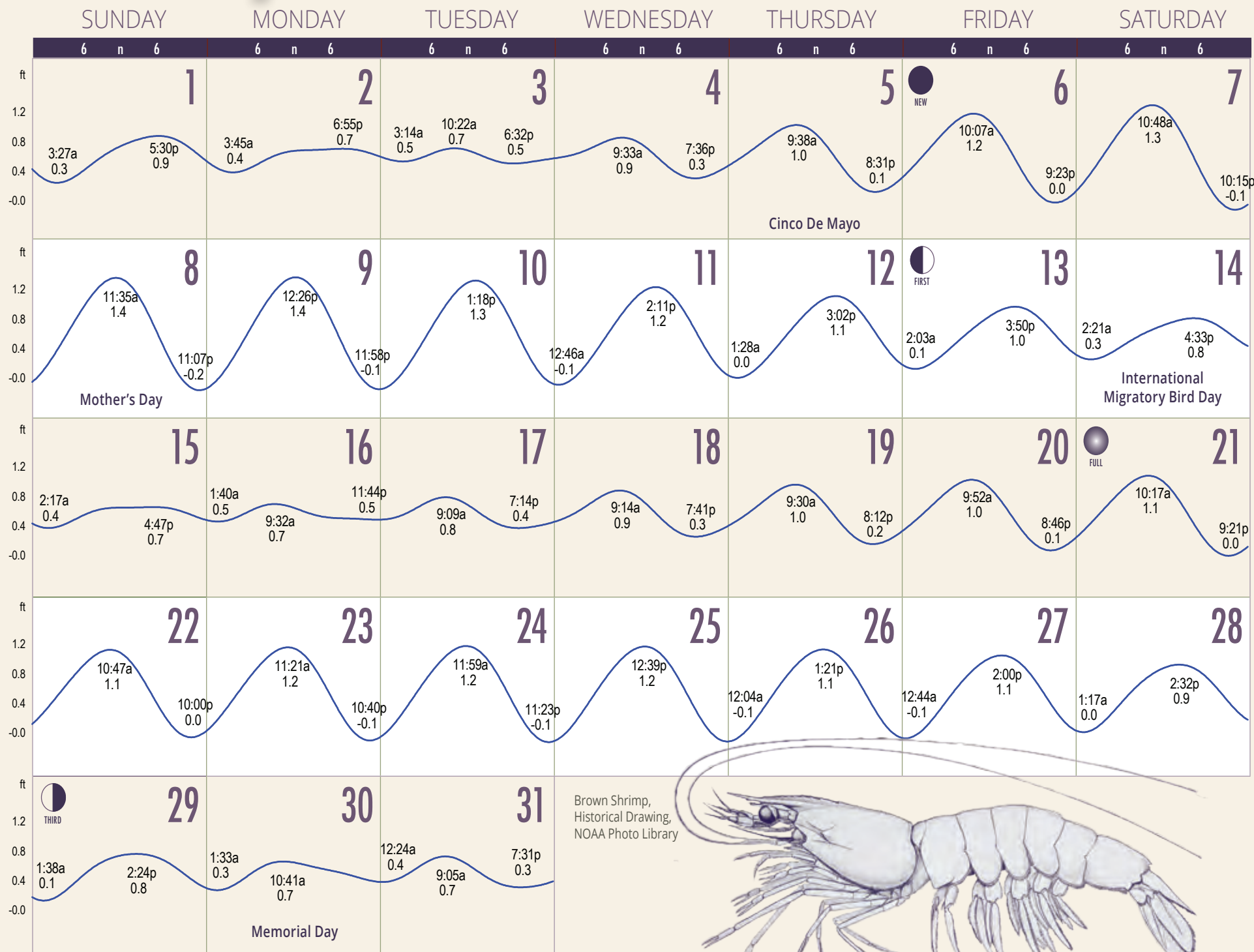


Cocodrie Louisiana, Nbogan1, Dreamstime.com



Shrimp in net courtesy of Morgan City Archives

May 2016



APRIL

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JUNE

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26	27	28	29	30		

High Tide:

May 9
12:26 p.m. • 1.4 ft.

Low Tide:

May 8
11:07 p.m. • -0.2 ft.

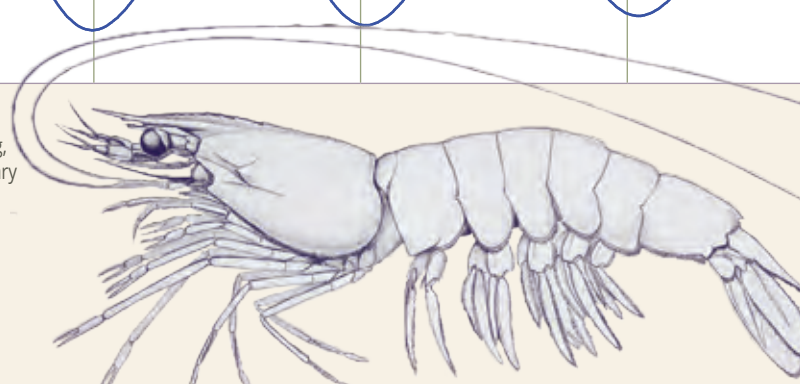


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Brown Shrimp,
Historical Drawing,
NOAA Photo Library

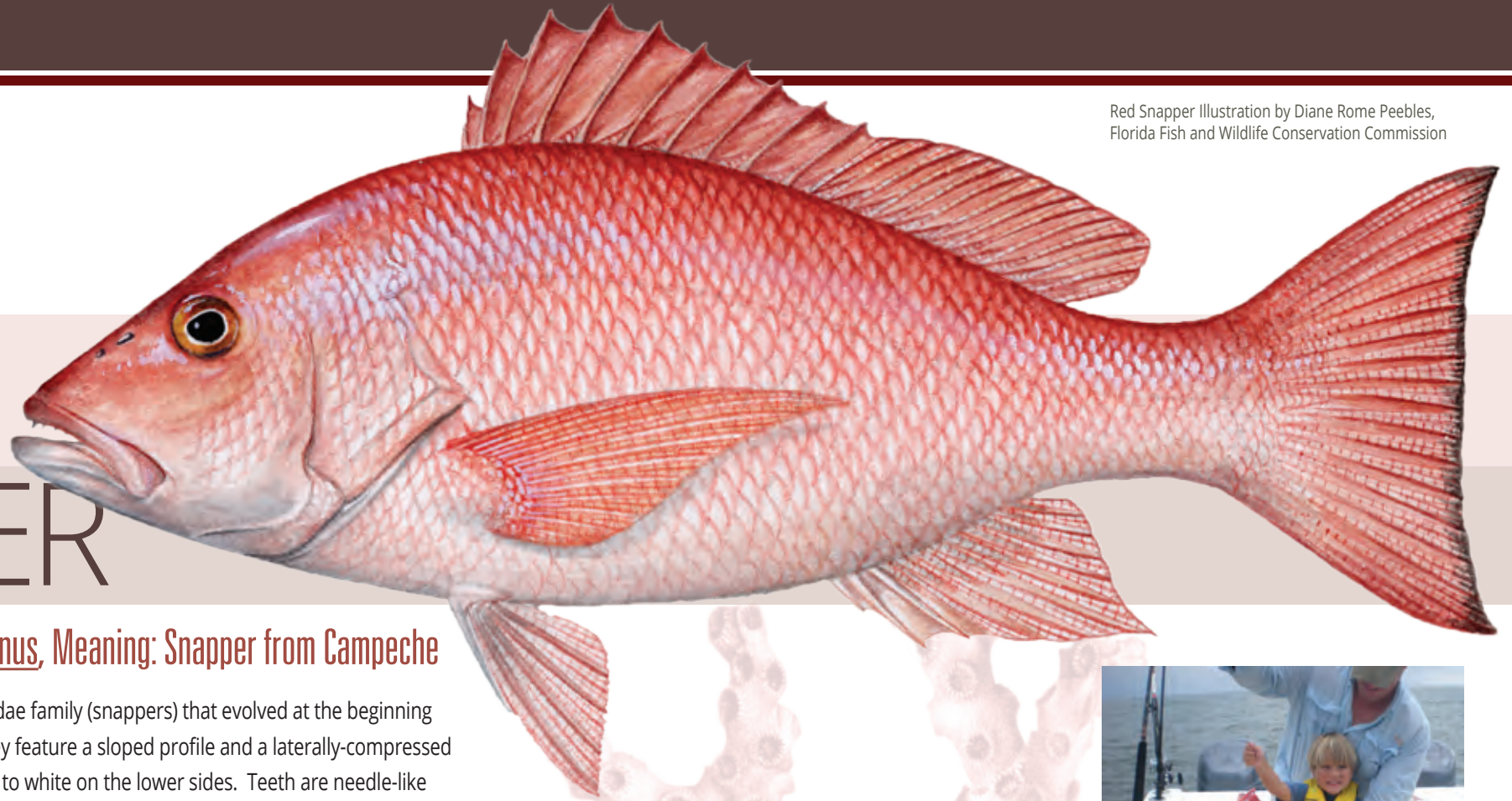


Red Snapper Illustration by Diane Rome Peebles,
Florida Fish and Wildlife Conservation Commission

RED SNAPPER

Scientific Name: Lutjanus campechanus, **Meaning:** Snapper from Campeche

Red snapper are popular reef fish in the Lutjanidae family (snappers) that evolved at the beginning of the Eocene Epoch 55.5 million years ago. They feature a sloped profile and a laterally-compressed body that is bright red on the back and light red to white on the lower sides. Teeth are needle-like and the eye is red. Dorsal fins are spiny and the caudal fin is truncated and notched. They range from Massachusetts through the Gulf of Mexico. Red snapper are omnivorous predators. The name "snapper" comes from their tendency to bite at anything, including bare hooks. They commonly live in waters between 30 to 200 feet, forming large schools near the bottom around natural and artificial reefs. Oil rigs or artificial reefs provide "three-dimensional habitat." It is debated whether rigs only attract fish or actually increase fish numbers due to an increase in habitat. Red snapper are parasitized by the organism, Cymothoa exigua, a type of isopod that attaches itself to the fish's tongue, causing it to fall off. The parasite then functions as the tongue of the fish. Snappers are fast-growing and commonly reach a length of 24 inches but can reach a maximum length, weight and age of 39 inches, 85 lbs. and 59 years. Once they reach two years or more in age and about 15 inches in length, they begin spawning offshore in the Gulf of Mexico from May to September. Spawning takes place between dusk and midnight in open water, where they release eggs and sperm simultaneously. Eggs hatch within about 24 hours. Larvae feed on plankton, then shift to feeding on small fish, squid, worms and crustaceans. As snappers near one year, they move to high relief habitat, while older, larger fish become territorial and guard territories in the lower part of the reef. Once the lunar-driven tides and warm temperatures return in May, the cycle begins over again.



(4)



(1)

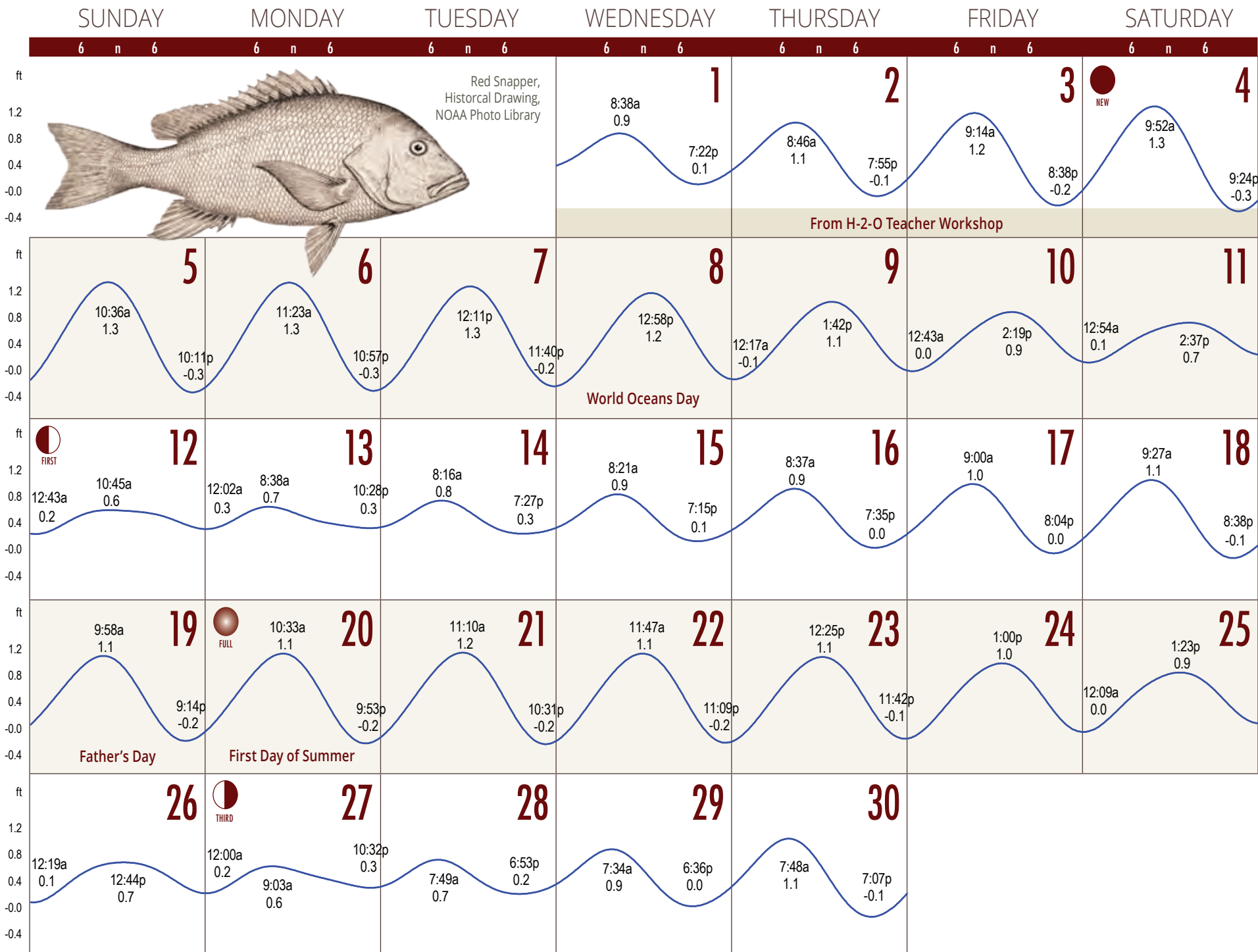


(2)



(3)

June 2016



MAY

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JULY

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24	25	26	27	28	29	30
31						

High Tide:
June 5
10:36 a.m. • 1.3 ft.

Low Tide:
June 5
10:11 p.m. • -0.3 ft.

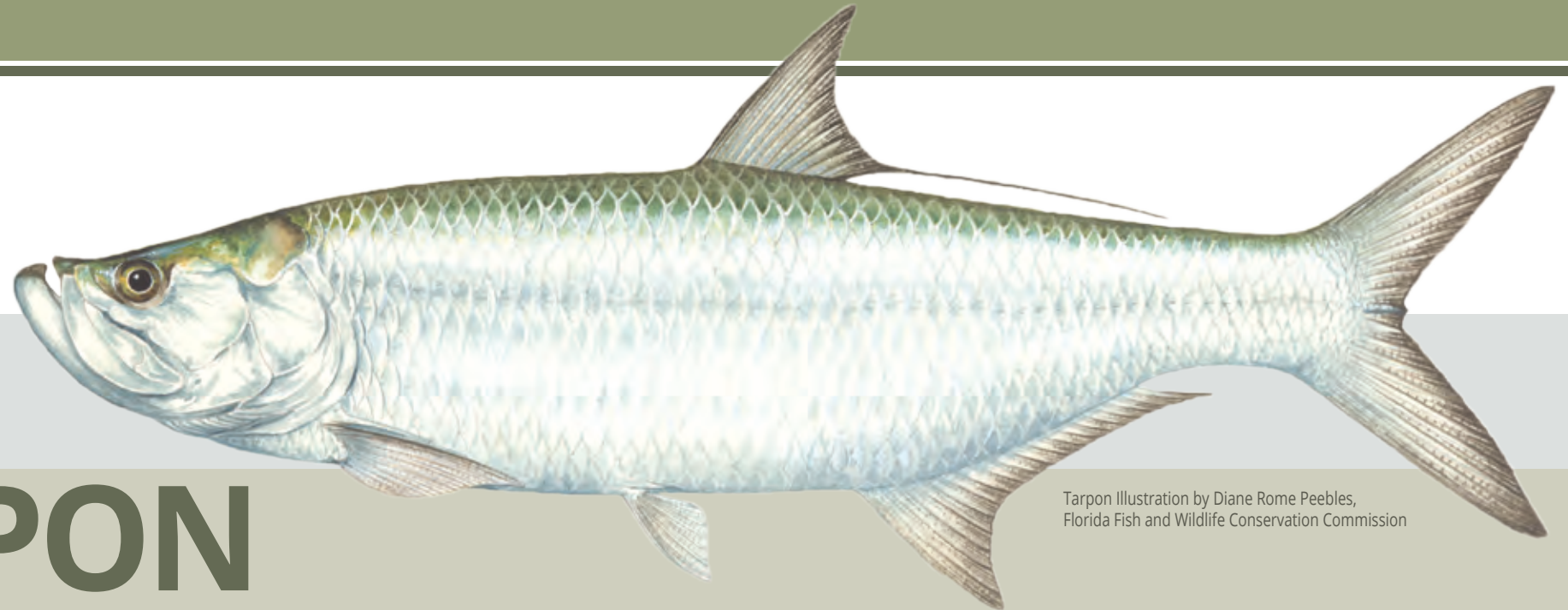


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TARPON



Tarpon Illustration by Diane Rome Peebles,
Florida Fish and Wildlife Conservation Commission

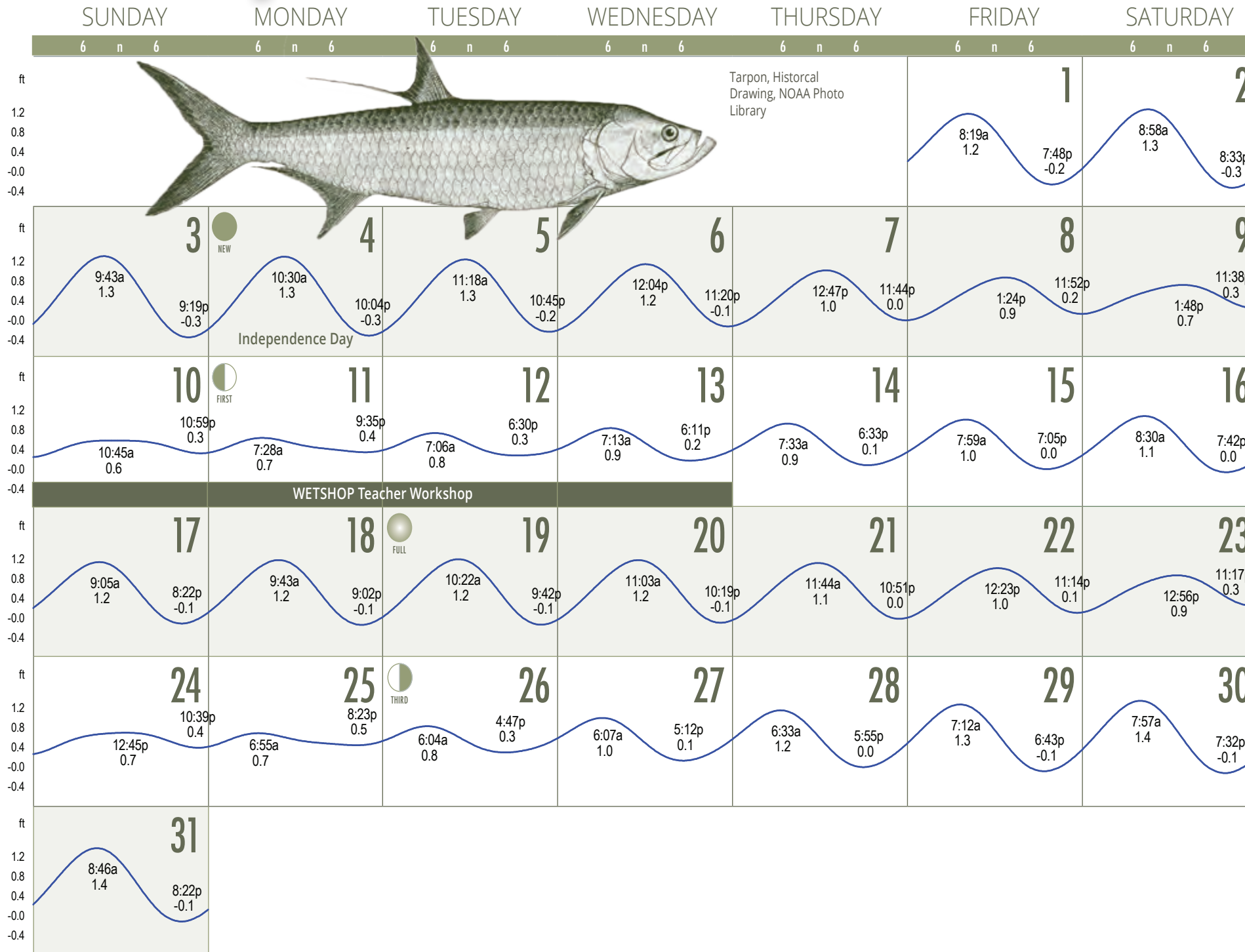
Scientific Name: Megalops atlanticus, **Meaning:** Large-Eyed Atlantic Fish, Large Scale

Atlantic tarpon are large, hard fighting game fish in the Megalopidae family (tarpons), which evolved during the Miocene Epoch from 2.5 to 23 million years ago. They range from Virginia through the Gulf of Mexico to Brazil in North America and from Senegal to the Congo in Africa. Tarpon are vertical-sided silvery fish with large scales; a large upturned mouth containing small, densely packed teeth; a narrow dorsal fin with a heavy filament on the rear of it; and a tail that is deeply forked. Tarpon have a modified swim bladder that contains spongy alveolar tissue that they can fill with air directly gulped from the surface. This evolutionary adaptation enables them to survive in low oxygen waters and be strong, rapid swimmers. Female tarpon can grow to 8.2 feet in length, 350 lbs. and live over 50 years. They are slow-growing fish and become sexually mature at 6 to 7 years of age. Spawning occurs in the late spring to early summer in off-shore areas where currents can carry their eggs to inshore marshes. Eggs hatch into larvae that are classified into three stages: 1) Stage 1 lasts 2-3 months. The ribbon-like larvae grow from 0.25 to 1.1 inches and absorb nutrients directly through their outer skin. 2) Stage 2 lasts 20 to 25 days. The larvae stops feeding and growing and shrinks to 0.5 inch. 3) Stage 3 lasts for 7 to 8 weeks. The larvae grow again, feeding on plankton, until reaching 1.6 inches. At this length, the fish is considered a juvenile. As juveniles, they switch from feeding on plankton to fish, large crabs and shrimp. Adults eat mullet, pinfish and marine catfish, using their small teeth to capture prey, and then swallowing the animal whole. They feed in a variety of warm coastal bays and marsh habitats throughout their range, growing slowly until they are sexually mature enough to begin the cycle again.

Spearing Tarpon, Photos Courtesy of Book of Tarpon, AW, Dimock Biodiversity Heritage Library



July 2016



JUNE

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			1	2	3	4
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12	13	14	15	16	17	18
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AUGUST

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14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

High Tide:

July 31

8:46 a.m. • 1.4 ft.

Low Tide:

July 3

9:19 p.m. • -0.3 ft.



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Tides & Currents by Jeppesen Marine
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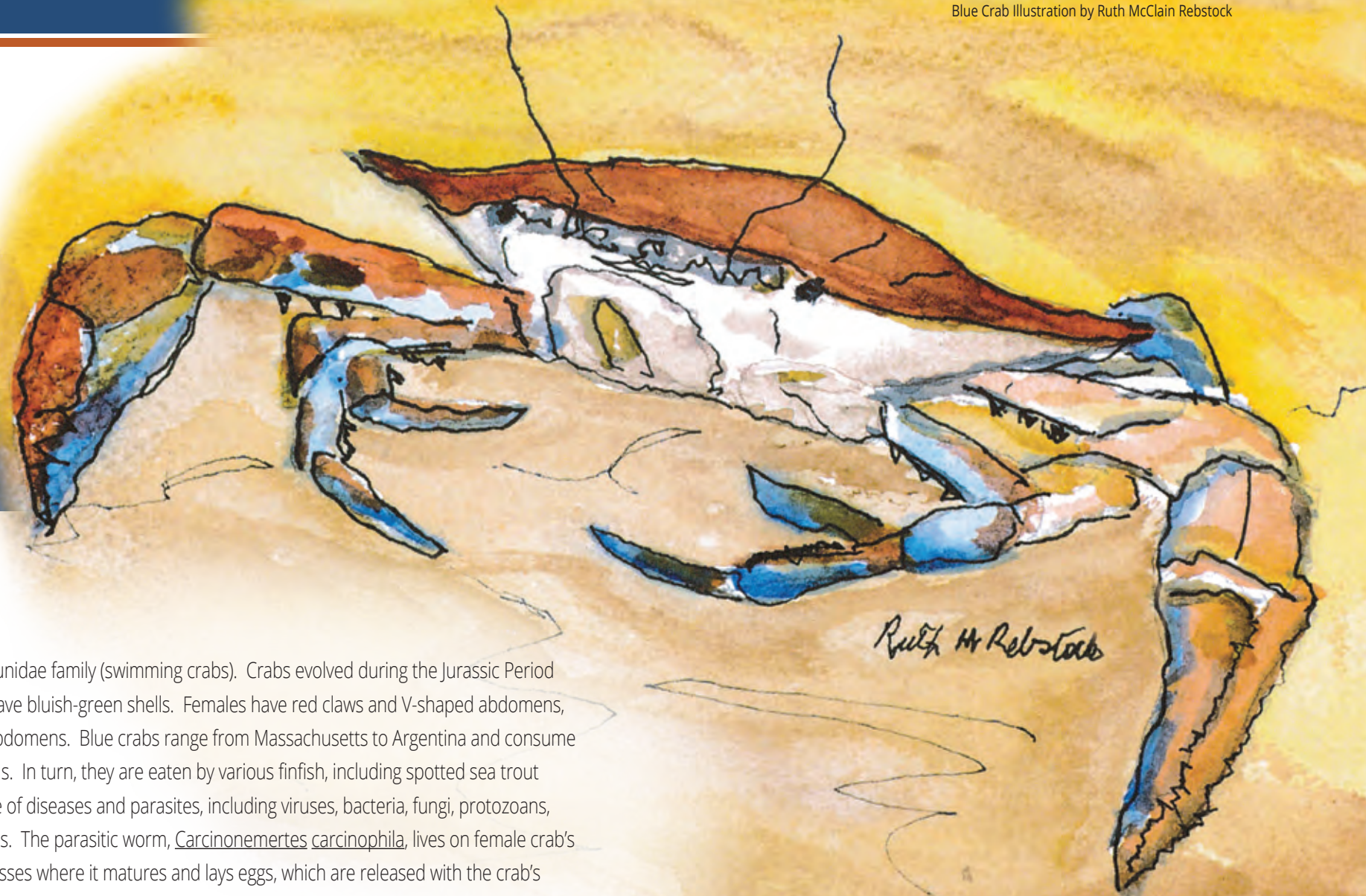
Tide adjustment table can be found on the inside back cover

Blue CRAB

Scientific Name: Callinectes sapidus,

Meaning: Beautiful Savory Swimmer

Blue crabs are decapod crustaceans in the Portunidae family (swimming crabs). Crabs evolved during the Jurassic Period from 200 to 145 million years ago. Blue crabs have bluish-green shells. Females have red claws and V-shaped abdomens, whereas males have blue claws and T-shaped abdomens. Blue crabs range from Massachusetts to Argentina and consume a wide variety of live and dead plants and animals. In turn, they are eaten by various finfish, including spotted sea trout and red drum. Blue crabs are subject to a range of diseases and parasites, including viruses, bacteria, fungi, protozoans, worms, amoebas, dinoflagellates and trematodes. The parasitic worm, Carcinonemertes carcinophila, lives on female crab's gills as juveniles and moves to the crab's egg masses where it matures and lays eggs, which are released with the crab's eggs. Crabs grow by shedding their exoskeleton during molting. The old, smaller shell is shed and a new, larger shell hardens in its place. Male blue crabs can mate several times during their lives, whereas females mate only once during their last molt when the abdomen changes to a semicircular shape. Immature females migrate to the fresher upper estuaries during the summer where the males reside. Males seek out receptive females, guard them until they molt, and then inseminate them. The male guards the female until her shell hardens. Females transport sperm and egg to tidal passes where they have multiple spawnings, releasing millions of eggs to outflowing tides and Gulf waters. Larvae go through eight zoea stages, floating near the surface and feeding on plankton. They then molt into megalops larvae, which are free-swimming and clawed. In this stage, they move with tides into brackish estuaries. The salinity and chemistry of brackish waters cause larvae to change from the megalops to the juvenile form. Blue crabs spend the remainder of their lives in the estuary, becoming adults and beginning the cycle over again.



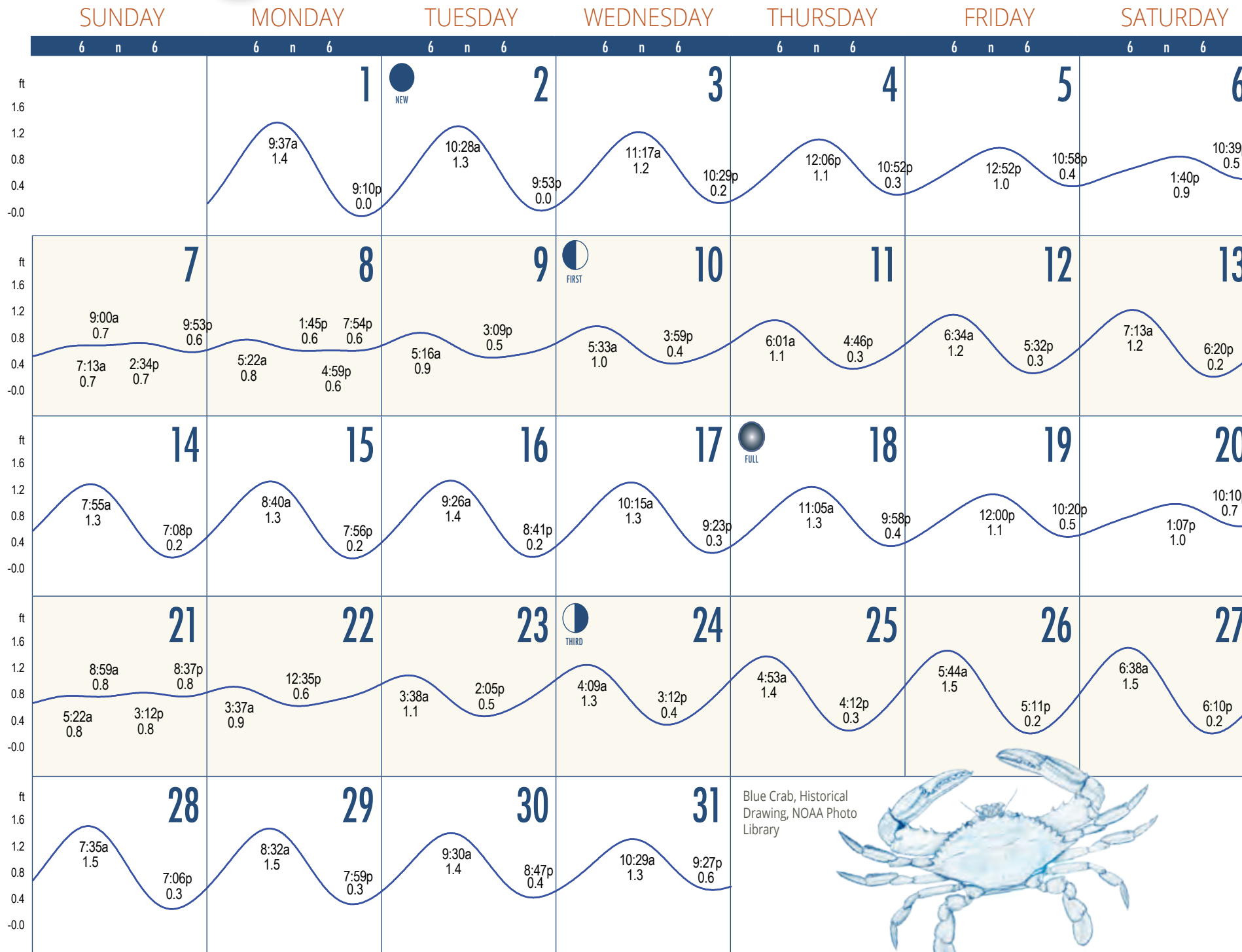
(1)



(2)

(1) Female and male Blue Crabs_NOAA Photo Library
(2) Paul Rudolph of Barataria Catching Blue Crab, Unknown Photographer

August 2016



JULY

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

SEPTEMBER

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

High Tide:
August 28
7:35 a.m. • 1.5 ft.

Low Tide:
August 1
9:10 p.m. • 0.0 ft.



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Tides from Barataria Bay, Grand Isle, East Point,
29d 15'48" N 89d 57' 24" W
Tides & Currents by Jeppesen Marine
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Tide adjustment table can be found on the inside back cover

Photo top left: Two Blue Crabs, © Pipa100, Dreamstime

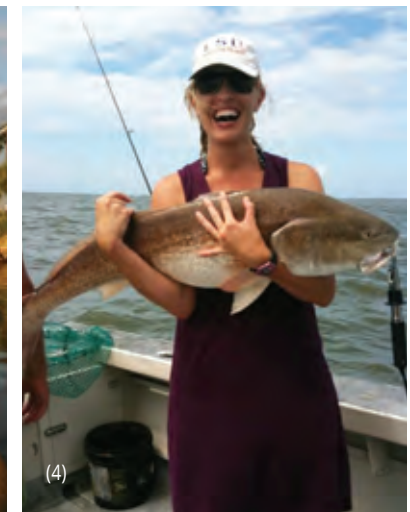
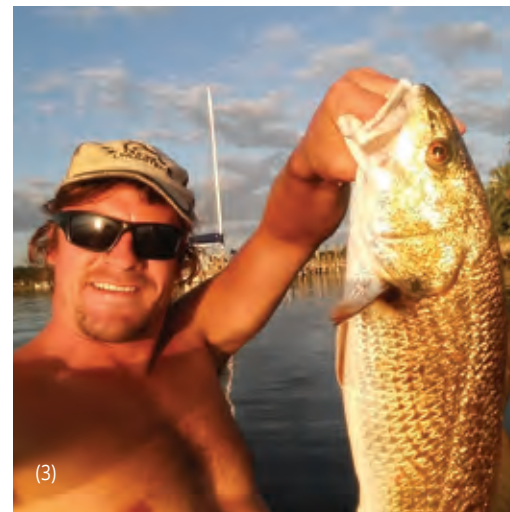
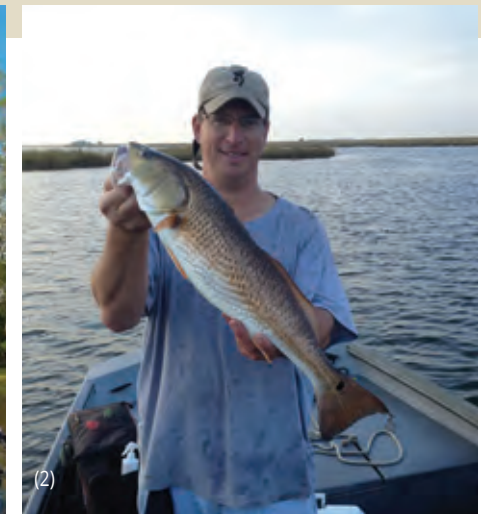
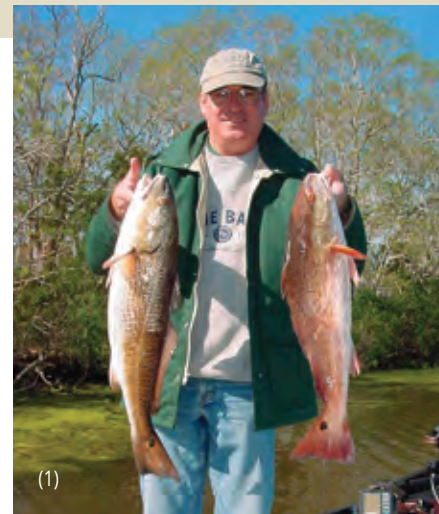
Red DRUM



Red Drum Illustration by Diane Rome Peebles,
Florida Fish and Wildlife Conservation Commission

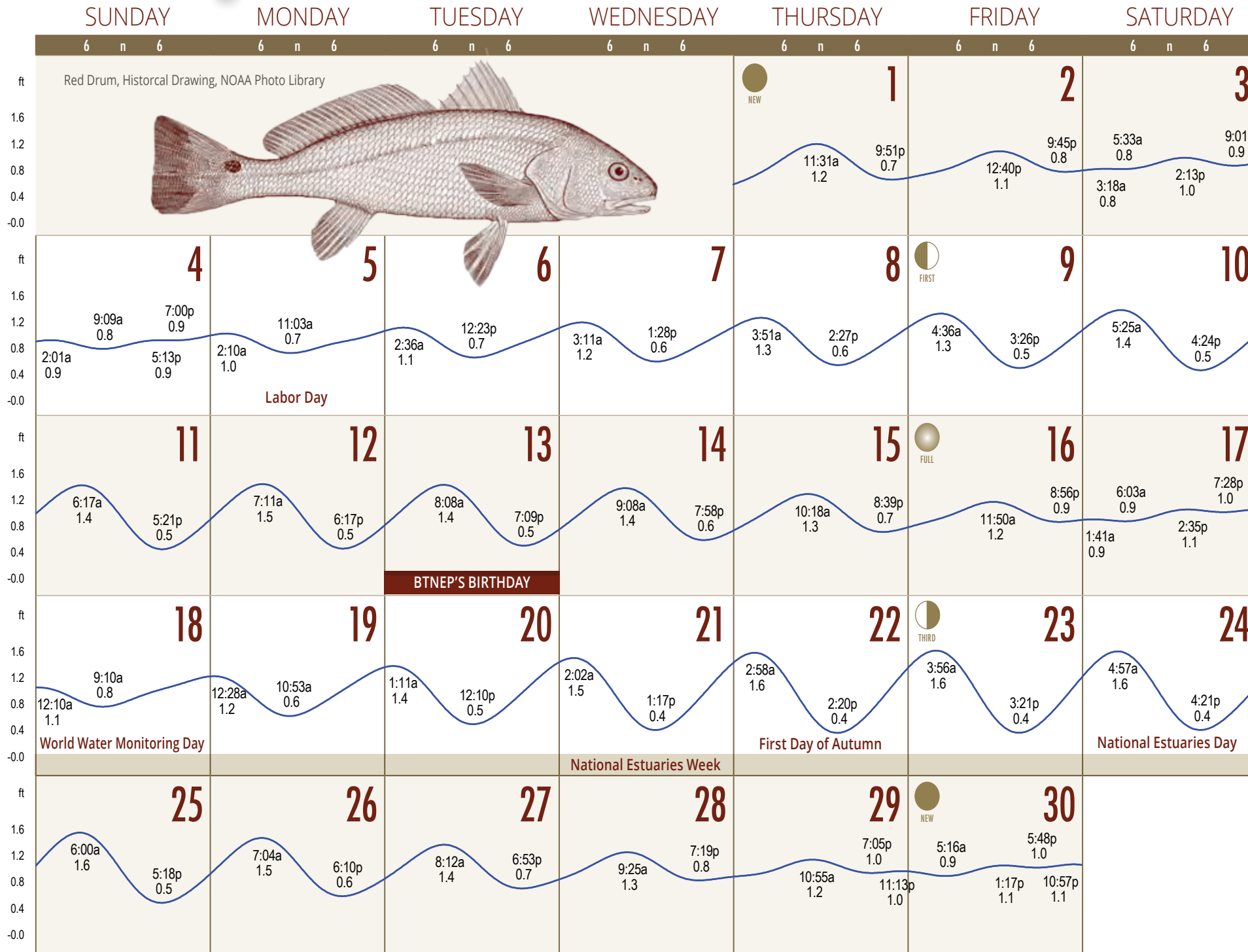
Scientific Name: Sciaenops ocellatus, Meaning: Eye-Spotted Red Fish

Red drum are finfish in the Sciaenidae family (drum fish). The genus Sciaenops evolved during the Miocene Epoch about 16 million years ago. Sciaenidae also contains spotted sea trout, black drum and Atlantic croaker. Red drum range from Massachusetts through the Gulf of Mexico and can grow up to 61 inches in length, 94 lbs. in weight and 50 years in age. Their torpedo-shaped bodies are golden red on the back and white on the belly with one or more “eyespot” near the tail. Eyespots are believed to be an evolutionary adaptation for confusing predators. Red drum use sight, smell, touch and down-turned mouths to feed on crabs, shrimp, mullet and menhaden. They aggressively feed near the tops or bottoms of channels and marsh ponds, growing to 13 inches in their first year. Sexually-mature red drum spawns in the tidal passes between barrier islands from mid-August to mid-October. Males are mature by age 5 and form large schools called drumming aggregations to attract sexually-receptive females. Males beat specialized muscles against their swim bladders to make the drumming sound. Females mature by age 6 and spawn every 2 to 7 days over an 8 to 9 week period, producing 20-40 million eggs per year. Eggs hatch in about 24 hours. The larvae are swept into estuaries and marshes with inflowing tides. Larvae are 0.23 to 0.3 inch and grow about 0.02 inch per day, feeding on plankton. Juveniles shift to a diet of small crustaceans and marine worms, occasionally becoming the intermediate host for the nematode parasite, Contracaecum multipapillatum, which infects their kidneys, matures and completes its lifecycle in birds. At about 8 inches, red drum shift to the adult diet of crustaceans and finfish, remaining in the estuaries until they are sexually-mature when they return to the tidal passes to begin the cycle again.



(1) Redfish, Kerry St Pe; (2) Red Drum, Dean Blanchard, Kerry St Pe;
(3) Dave Selfie, Redfish, Dave Curtiss; and (4) Erin Kinnard, Bull Red Drum, Matt Benoit

September 2016



AUGUST

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	1	2	3	4	5	6
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21	22	23	24	25	26	27
28	29	30	31			

OCTOBER

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

High Tide:
September 23
3:56 a.m. • 1.6 ft.

Low Tide:
September 22
2:20 p.m. • 0.4 ft.



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29d 15'48" N 89d 57' 24" W
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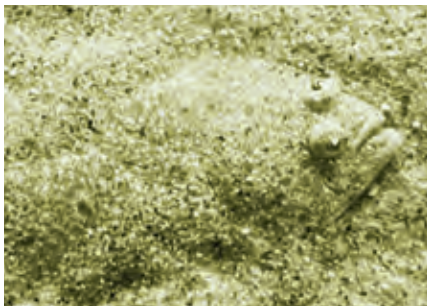
Tide adjustment table can be found on the inside back cover

Southern Flounder

Scientific Name: Paralichthys lethostigma, **Meaning:** Parallel fish with forgotten spots

Southern flounder are in the Paralichthyidae family (large-toothed flounders). The genus Paralichthys evolved about 12.5 million years ago during the Miocene Epoch. Southern flounders have a geographical range from North Carolina to Texas, living in brackish estuaries to shallow, saline and offshore waters. They are laterally-compressed and have both eyes on the left side, which is olive-brown with dark and white spots. The right side is white and eyeless. Flounders hatch with an eye on both sides of their head, but the right eye migrates to the left side of the head when they are about 1 inch in length. Juveniles feed on small invertebrates and change to a fish diet when they are 8 inches long. Southern flounder are ambush predators that camouflage their flattened bodies on the bottom and wait motionless while using their well-developed vision to track prey until the prey come within striking distance. Adults feed on shrimp, striped mullet, menhaden and bay anchovies, eating 4 to 8 percent of their body weight each day. Males grow slower and have shorter life spans than females, almost never living over 3 years or growing more than 14 inches. Females mature at 2 years and can reach 28 inches and 6 years of age. Males live offshore after their first year; whereas females live in low salinity estuarine waters. Spawning migrations begin in mid-October and November when temperatures cool down. Females and males

meet offshore where they stage in large numbers. Spawning takes place between November and January every 3 to 7 days producing between 40,000 to 62,000 eggs per spawn. Eggs hatch offshore and larvae are carried into estuaries and marshes with inflowing tides where they mature to adults. Often spawning migrations can move fish to estuaries far away from their original home. Around March the females move back into the muddy-bottomed estuaries to start the cycle over again.



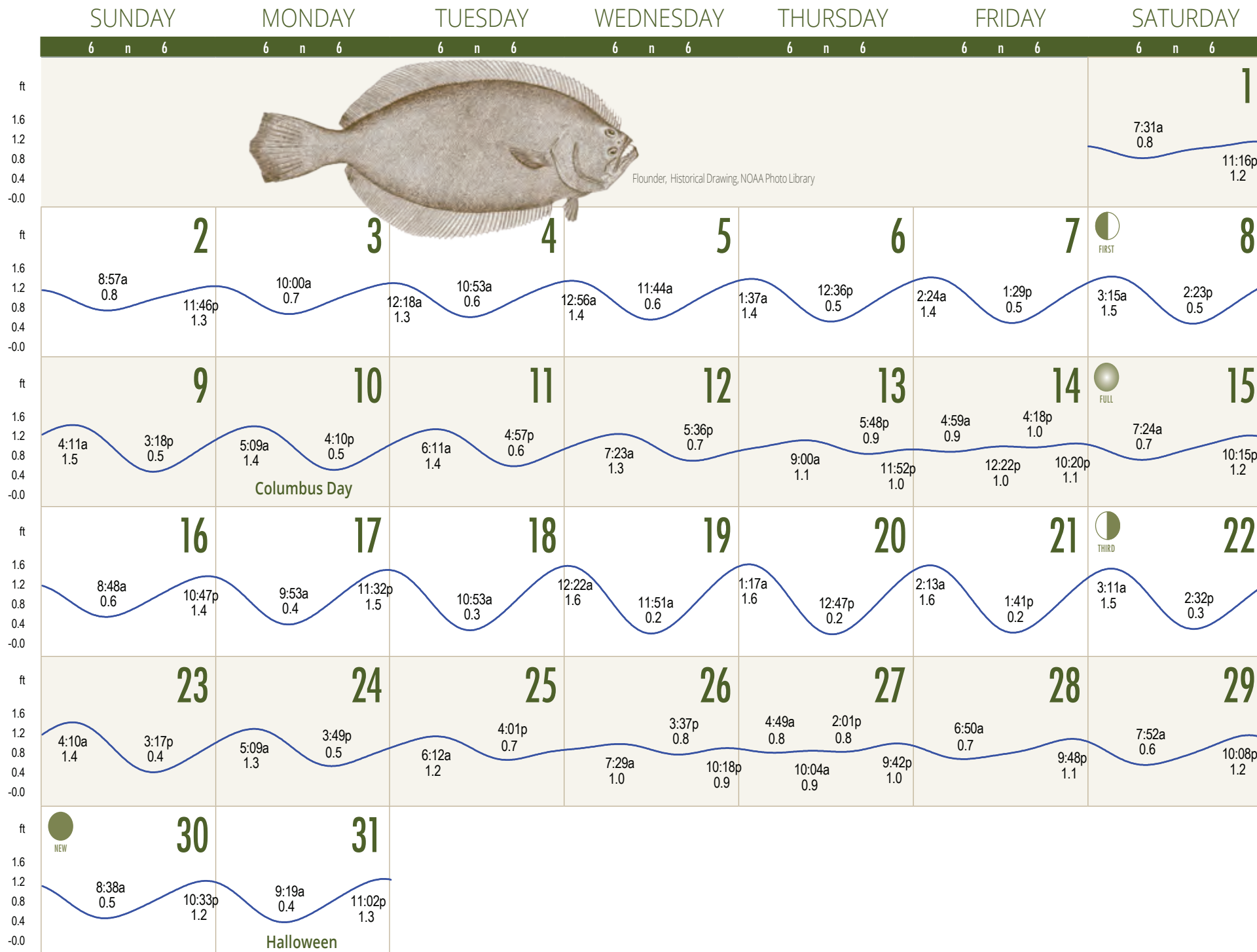
Buried Flounder, Gulf Coast Research Lab



(right) Range Map of Southern Flounder, USGS; (below) Amphistium fossil flatfish, Wikimedia Commons



October 2016



SEPTEMBER

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				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

NOVEMBER

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20	21	22	23	24	25	26
27	28	29	30			



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Eastern Oyster

Scientific Name: Crassostrea virginica,
Meaning: Thick-Shelled Virginia Oyster

Eastern oysters are bivalve mollusks in the Ostreidea family (oysters). Bivalves are an ancient animal order that evolved at the beginning of the Cambrian Period about 540 million years ago. Eastern oysters range from Canada to Mexico and are enclosed by a shell consisting of two hinged halves called valves joined together with a ligament and interlocking "teeth" to form a "bivalve." Their thick shells are composed of calcium carbonate precipitated from seawater that the oyster secretes in layers as hard shell. They occupy low energy brackish water habitats in coastal estuaries. Oysters are ecologically and environmentally important because a huge number of bivalves, crustaceans, worms, finfish, etc., are dependent upon oysters for hard substrate habitat, food, and water filtration. A single oyster can filter up to 50 gallons of water per day using modified "sticky" gills called ctenidia, from Greek meaning comb, which are specialized organs for feeding and breathing. They pump water through the ctenidia, filtering out plankton and detritus, which they consume. Synchronous spawning occurs in the spring and again in the fall when water temperatures rise to and fall below 77 degrees (F). Males release sperm to fertilize the millions of eggs released by females into the water. The fertilized eggs transform through several free-swimming larval stages and develop a shell in about 2-3 weeks, finding a place to settle, attaching and never moving again. Once attached to a reef, the larvae are called spat oysters and are about 0.02 inch long and look like little red dots. Oysters are protandric hermaphrodites, meaning that they start life as males but later change to females. By the time an oyster is 2.5 inches long, there is a 90% chance it has changed to a female. Once oysters are sexually-mature and the temperatures are right, the cycle begins again.



Eastern Oyster Courtesy of NOAA



(1)



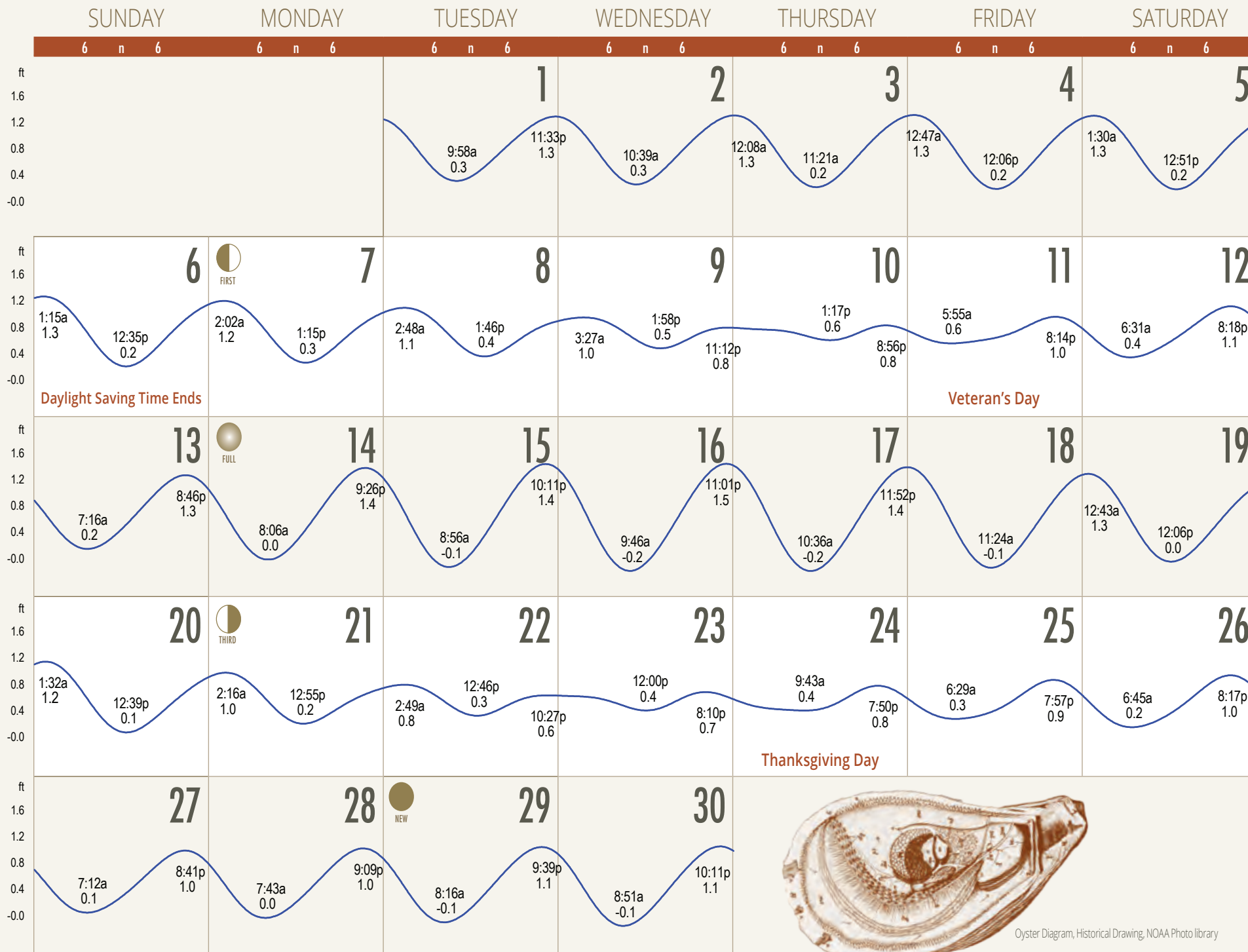
(2)



(3)

(1) Easter Oysters by Earl Melancon, (2) Seed Oysters by Earl Melancon; (3) Oysters in Dredge, Earl Melancon

November 2016



OCTOBER

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

DECEMBER

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				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

High Tide:
November 16
11:01 p.m. • 1.5 ft.

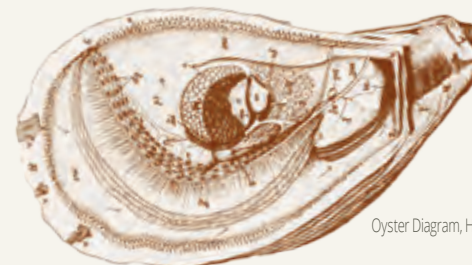
Low Tide:
November 17
10:36 a.m. • -0.2 ft.



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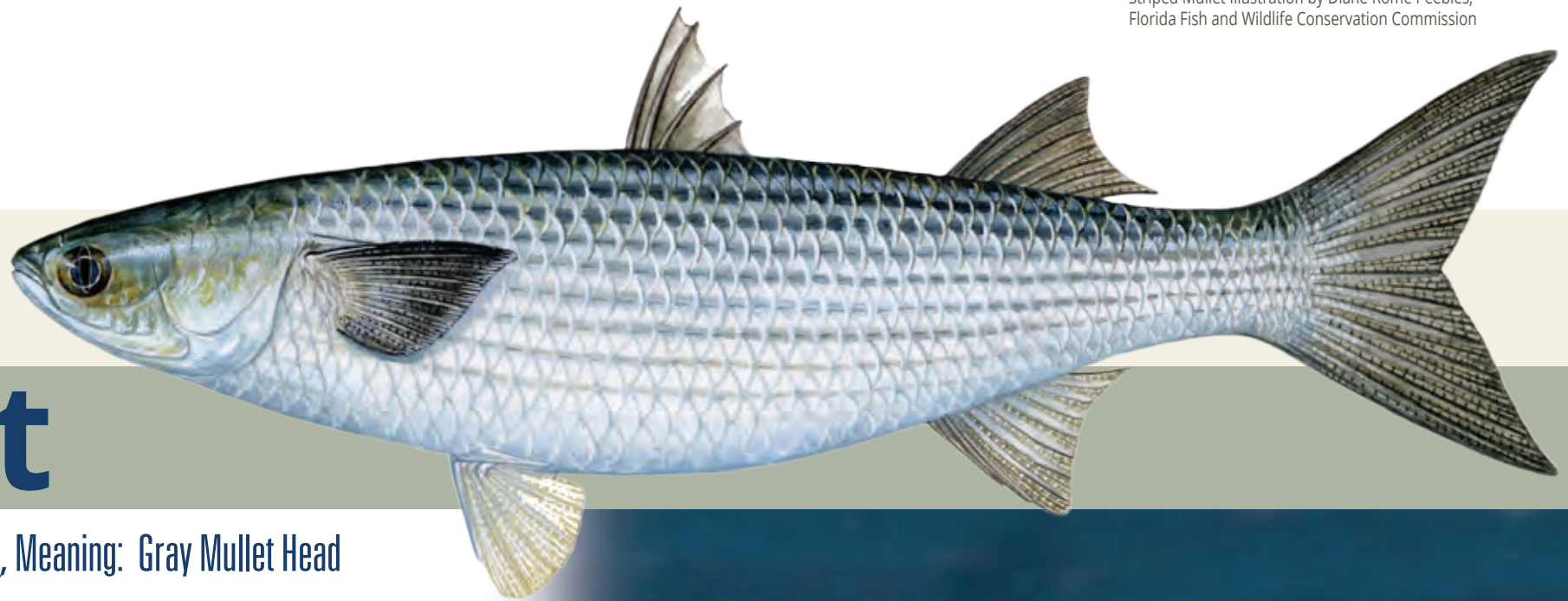
Tide adjustment table can be found on the inside back cover



Oyster Diagram, Historical Drawing, NOAA Photo library

Striped Mullet Illustration by Diane Rome Peebles,
Florida Fish and Wildlife Conservation Commission

Striped Mullet



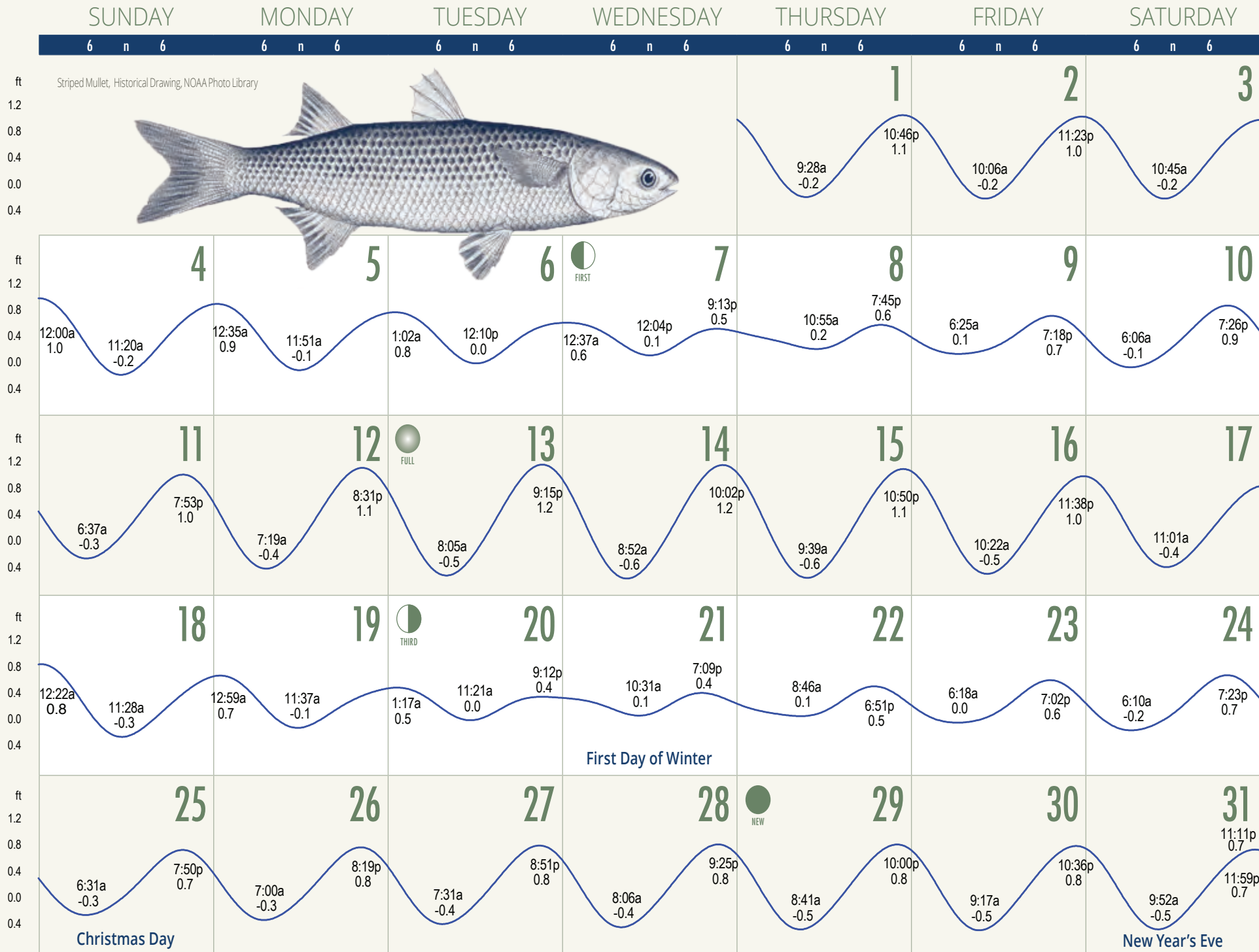
Scientific Name: Mugil cephalus, **Meaning:** Gray Mullet Head

Striped mullet are fish in the Mugilidae family (mullet). The genus Mugil evolved during the Oligocene Epoch 34 million years ago. Mullet range throughout the world in warm tropical to temperate fresh and saline waters. They have torpedo-shaped bodies that are silvery-green on top fading to white on the sides and belly. Large eyes top off a wide flat head and a triangular mouth. They thrive in both fresh and salt water environments, reaching up to 47.2 inches, 17.6 lbs. and 16 years of age. It is thought that jumping is an evolutionary adaptation of mullet to escape from predators and to fill their pharyngobranchial organ with air, which increases their survival in low oxygen water. Immature and adult fish feed on tiny vegetable matter and plankton. They suck up mud and sand with food, which is used to grind food in a gizzard-like organ before digestion. During the first year of life, mullet stay in saltier estuarine waters, growing about two times faster during warm months. Mullet mature when they are 8 to 10 inches in length, within their third year of life, with females maturing at slightly larger sizes than males. Males and females migrate offshore to spawn. If females are unable to complete the migration, they will reabsorb their gonads and eggs. Spawning occurs offshore during November and December in large schools, which become important prey for a large variety of predatory species and humans, because they are fat and full of eggs. Humans use gill nets, trammel nets, and commercial seines to capture the fish. Spawning migrations take a heavy toll on individuals as they return to fresher areas with less fat, damaged fins and lesions, migrating between 20 and 100 miles during their lifetimes. Eggs are carried by currents and tides, hatching in estuaries, beginning the cycle again.

(right) Striped Mullet, Mugil cephalus, Minorca, Creative Commons
(left) Line Drawing Striped Mullet Mugil cephalus, Wikimedia Commons, Eugene Van der Pijl



December 2016



NOVEMBER 2016

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
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27	28	29	30			

JANUARY 2017

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

High Tide:

December 13
9:15 p.m. • 1.2 ft.

Low Tide:

December 14
8:52 a.m. • -0.6 ft.



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Courtesy of Righteous Fur

TIDE CORRECTIONS

To find the best time to fish your favorite locations, find a location that is closest to your area and add or subtract the time from the corresponding daily prediction.

AREA	LOW (Hours:Minutes)	High (Hours:Minutes)
Shell Beach, Lake Borgne	+5:10	+4:01
Chandeleur Lighthouse	+0:38	+0:05
Venice, Grand Pass	+1:28	+1:06
Southwest Pass, Delta	-0:29	-1:29
Empire Jetty	-1:35	-2:03
Bastian Island	+0:22	-0:19
Quatre Bayou Pass	+0:27	+1:18
Independence Island	+2:09	+1:29
Caminada Pass	+1:44	+1:14
Timbalier Island	+0:33	-0:41
Cocodrie, Terrebonne Bay	+2:50	+1:10
Wine Island	+1:12	+0:08
Raccoon Point	-0:10	-1:03
Ship Shoal Light	-1:40	-2:54

Charts in this calendar are intended for use solely as a reference guide to Louisiana fishing. It is not intended for navigational use. BTNEP makes no warranty, expressed or implied, with respect to the accuracy or completeness of the information contained in these charts. BTNEP assumes no liability with respect to the use of any information contained in this document.

BTNEP THANKS...

Ruth McClain Rebstock and family

Terrebonne Parish Consolidated Government for their generous contribution in helping to print this calendar.



2016 TIDAL GRAPH CALENDAR

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Cover photo collage created using the following images: (1) Red drum, Robert Hines, Wikimedia Commons; (2) Red drum, National Digital Library; (3) Tarpon, Diane Rome Peebles, Florida Fish and Wildlife Conservation Commission; (4) Pearl of the Estuary, Louisiana Oysters, Ruth McClain Rebstock; and (5) Gulf Menhaden, Diane Rome Peebles, Florida Fish and Wildlife Conservation Commission

FISHING REGULATIONS

This is not a comprehensive or official copy of the laws in effect and should not be utilized as such. Size and creel limit regulations are presented for selected species only. These species as well as other species may be managed by seasons, quotas and permits. Different regulations for bass, catfish and crappie may apply within specific areas. Contact the Louisiana Department of Wildlife and Fisheries (LDWF) for specific information.

FRESHWATER SPECIES

SPECIES	SIZE LIMIT	DAILY LIMIT
Large mouth and Spotted Bass	None	10
(Atchafalaya Basin and Lake Verret-Palourde Area)	None	7
Crappie (Sac-a-lait)	None	50
Striped or Hybrid Striped Bass	None: 2 over 30" (TL)	5 (Any combination)
White Bass	None	50
Yellow Bass	None	50
Channel Catfish	25 less than 11" (TL)	100
Blue Catfish	25 less than 12" (TL)	100
Flathead Catfish (Spotted, Yellow or Opelousas)	25 less than 14" (TL)	100
Freshwater Drum (Gaspergou)	12" Minimum (TL)	25

100 total of
these three
species

SALTWATER SPECIES

SPECIES	SIZE LIMIT	DAILY LIMIT
Speckled Trout*	12" Minimum (TL)	25
(Cameron & Calcasieu Parishes**)	12" Minimum (TL), two over 25"	15
Red Fish*	16" Minimum (TL), one over 27"	5
Black Drum	16" Minimum (TL), one over 27"	5
Southern Flounder	None	10
Greater Amberjack	State & Federal Reg. 30" Min. (FL)	1
Cobia (Ling or Lemon Fish)	State & Federal Reg. 33" Min. (FL)	2
King Mackerel	State & Federal Reg. 24" Min. (FL)	2
Spanish Mackerel	State & Federal Reg. 12" Min. (FL)	15
Red Snapper***	State & Federal Reg. 16" Min. (TL)	***

* For Red Drum (Redfish) and Spotted Seatrout (Speckled Trout): Recreational saltwater anglers may possess a two day bag limit on land; however, no person shall be in possession of over the daily bag limit in any one day or while fishing on the water, unless that recreational saltwater angler is aboard a trawler engaged in commercial fishing for a consecutive period of longer than 25 hours.

** (Cameron & Calcasieu Parishes) Daily take and possession limit of 15 Spotted Seatrout (Speckled Trout); no person shall possess, regardless of where taken, more than two spotted seatrout exceeding 25 total inches in length, which are considered part of the daily bag and possession limit in state and coastal territorial waters South of 1-10 at the Louisiana/Texas border to its junction with LA HWY 171, south to Hwy's 14 and 27 near Holmwood, south along Hwy. 27 to Hwy. 82 to the Gulf of Mexico.

*** There are specific regulations for Red Snapper and Shark. Contact the LDWF for more information.

FORK LENGTH (FL): Tip of snout to fork of tail. TOTAL Length (TL): Tip of snout to tip of tail.

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